

The Origin of Stencil Duplicating

W.B.Proudfoot



580
B1

The Origin of Stencil Duplicating is the only documented and authoritative history devoted to this subject. Briefly mentioning the first uses of copying devices in the Babylonian era, Mr. Proudfoot traces a truly fascinating story up to and including the revolutionary years of 1875 to 1905. During the early part of this period stencils were considered in various forms but only emerged as a practical process in 1881. The process was perfected in 1888, subsequently extended to a stencil for use on the typewriter and thus revolutionized long-established office procedures.

The copying methods in use in the eighteenth-century and Victorian office prior to that brief but active period of innovation are described and discussed in the first part of this book. The story of the growth of stencil duplicating and the struggles of its pioneers is told in three subsequent parts: 'Handwriting Stencils', 'Typewriting Stencils' and 'Rotary Duplicators' in which the technical evolution of the process and its practice is traced. In crediting the inventors and assessing the commercial progress of stencil duplicating it is inevitable that the rise of the House of Gestetner and its founder David Gestetner should emerge as a central part of the story.

The art and practice of communication is now of vital international importance. The humble stencil duplicator was a major technical breakthrough and this book, with its background of thorough and original research, will not only be of value to students of business and industrial history, but will interest all those who like to view in a new perspective a process which has become part of their daily lives.

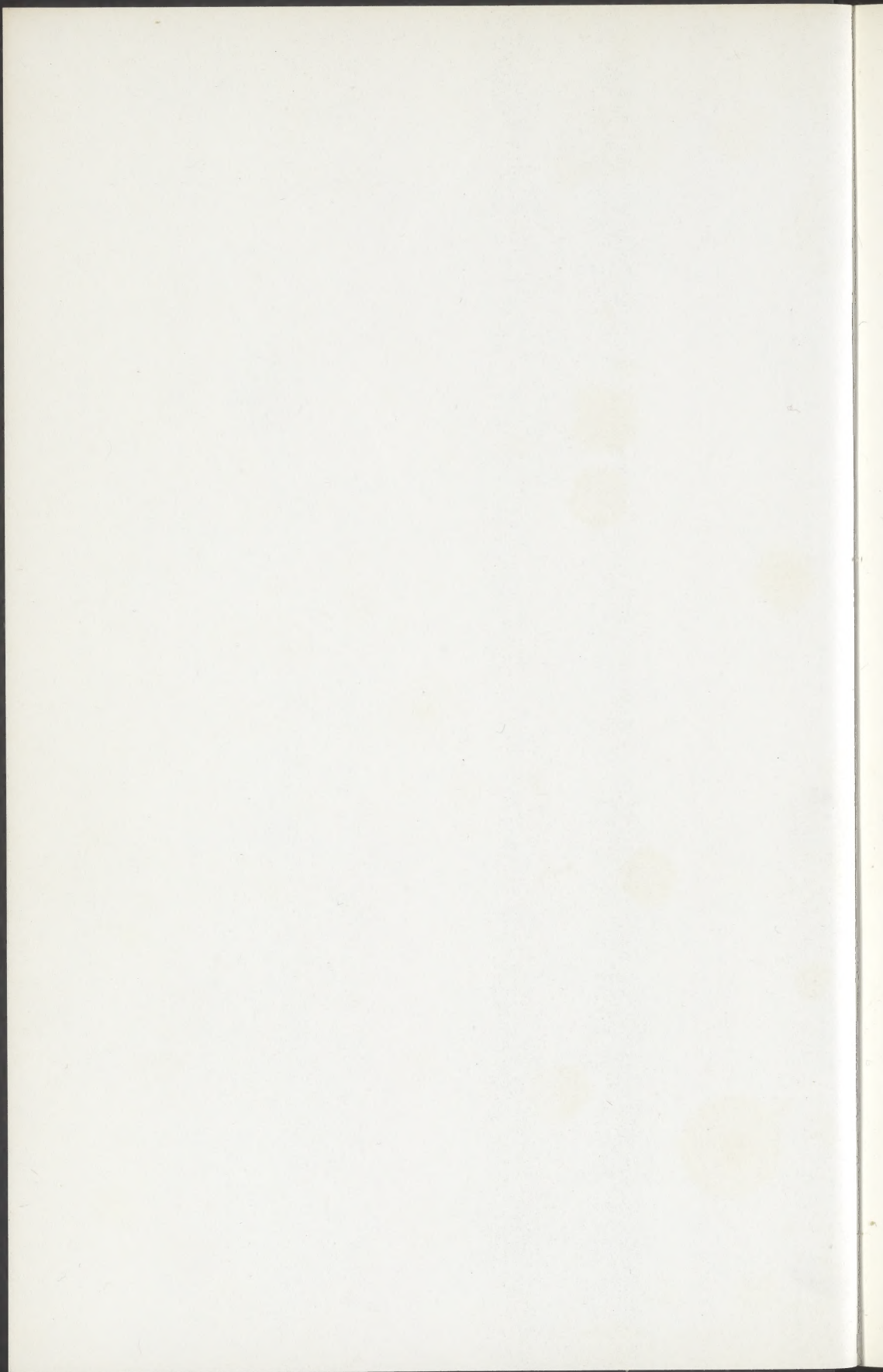
5803
BIBCI

62696

To Frank

Summer 74

Paul Weale



THE ORIGIN OF STENCIL DuplicATING

THE OFFICE OF THE SECRETARY OF THE ARMY

THE ORIGIN OF STENCIL DUPLICATING

W. B. PROUDFOOT



HUTCHINSON OF LONDON

HUTCHINSON & CO (*Publishers*) LTD
3 Fitzroy Square, London, W1

London Melbourne Sydney Auckland
Wellington Johannesburg Cape Town
and agencies throughout the world

First published 1972

© W. B. Proudfoot 1972

*This book has been designed and produced by Hutchinson Benham Ltd,
set in Times type and printed in Great Britain by
Ebenezer Baylis and Son Ltd
The Trinity Press, Worcester, and London
and bound by Wm. Brendon, Tiptree, Essex*

ISBN 09 109280 9

*To my wife Noreen for her encouragement
and help through many years*



CONTENTS

| | |
|---|-------------|
| <i>Introduction</i> | <i>page</i> |
| BEFORE STENCILS | 15 |
| Copying methods of the eighteenth and nineteenth century—Hartlib's ink 1665—Mill's patent 1714—Multiple pens—Watt's copying machine 1780—Wedgwood's manifold writer 1806—The letter copying book process—Carbon copies—Hectograph 1880 | |
| WRITING ON STENCILS | 37 |
| From copying to duplicating—The Papyrograph 1872—Edison's electric pen 1876—The Trypograph—Edison and the file plate process—Gestetner and the file plate process—The file plate process and the Far East—Gestetner's Cyclostyle 1881—Gestetner's patent for Japanese paper—Cyclostyling 1888—Early days of the Cyclostyle business—The Mimeograph—The Neostyle | |
| STENCILS FOR TYPEWRITING | 81 |
| From writing to typewriting—The problem—Yoshino—First typewriting stencil—Improvements—Writing on typewriting stencils—Automatic duplicating—Stencil business 1885-1895 | |
| BEGINNING OF A NEW ERA | 99 |
| The "modern office"—Two kinds of rotary duplicator—Lowe's single-drum machine patent—Rotary Neostyles and Mimeographs—Ellam's rotaries—Gestetner's twin cylinder machine patents—The Rotary Cyclostyle—D. Gestetner, manufacturer—D. Gestetner and the Cyclostyle Company—D. Gestetner and the Neostyle Company—A famous trademark lives on | |
| <i>Appendices</i> | 115 |
| <i>Index</i> | 123 |



Acknowledgments

I have many friends and helpers to thank, especially the directors of Gestetner Holdings Limited for their encouragement. Similar thanks are due to several other colleagues in the Company. In particular I would like to mention: David Gestetner, grandson of the founder, and present marketing director of the company, who has read the manuscript in great detail and made many valuable suggestions; H. J. Picking, formerly works director of Gestetner Limited, now retired, whose great knowledge and understanding of the process and its history were originally my inspiration and support; Dick Hughes, senior assistant, Gestetner Research, who gave great help in many of the searches and in the dissection and discussion of the results; and Richard Chenery, photographer at Gestetner Limited, for an infinite number of photographs well taken and patiently printed.

I am indebted also to the custodians of the Edison museums in the U.S.A. and wish to express appreciation in particular to Kathleen McGuirk, archivist at the Edison Historic Site, West Orange, New Jersey, for her kindness and help during my visit there in 1967. My thanks also to Melvin J. Weig, superintendent, Norman R. Speiden and Harold S. Anderson, curators of that Institute, for permission to search the Edison correspondence and other files. Thanks also to Charles Natzel at the other Edison Institute in Dearborn, Michigan, for access to various Edison exhibits.

Appreciation must also be made of assistance from W. E. Church of the Science Museum, London, and of the many discussions with him concerning the exhibits of copying and duplicating equipment on show or in store at South Kensington. The Crown Copyright pictures were obtained with his help.

And last, but not least, thanks to Mrs Veronica Watts of Potters Bar, Hertfordshire, for innumerable re-typings cheerfully and carefully done.

Lists of research and reading sources are included in appendices at the end of the book. Many of the photographs of apparatus, portraits, and other matters of interest, are acknowledged under the illustrations concerned.

W.B.P.

HEATHERLEA
Barnet, Herts.



INTRODUCTION

Stencil duplicating today is the most popular method of making many copies of typewritten matter in the modern office. It is the process in which a plastic-coated sheet, called the stencil, when typed, forms an image through which ink can be pressed so that any number of copies from one only to several thousands can be "run off" on a stencil duplicator, easily, quickly, and inexpensively. It is a basic office procedure. Typists in training learn to use stencils at the same time as they learn to type. It is so commonplace, and the stencil duplicator so familiar a piece of office equipment, that it is difficult to believe there could ever have been anything exciting or dramatic about it. Nevertheless the invention and development of the stencil process during the last quarter of the nineteenth century and its adoption by the commercial world of that time was an event of the greatest importance in the history of the office.

Duplicating by means of a stencil was a copying process so fundamentally different from any previous practice that it completely revolutionized the late nineteenth-century office. Indeed, commercial historians may well conclude that the evolution of the modern office began with the invention of the stencil and its association, soon after, with the typewriter. Great praise and appreciation are due, therefore, to the pioneers; the inventive and commercially minded gentlemen of the late Victorian period, who laboured devotedly to develop those revolutionary office methods. Outstanding among them is the name of David Gestetner, founder of the world's oldest office equipment manufacturing and selling organization.

A young, penniless emigrant from Hungary, he came to England and in 1881 started the duplicating business with the aid of a girl assistant in a small room in Sun Street in the City of London.

During my years of approaching retirement I became interested in the archives of the Gestetner company, where I was employed as research manager and with whom I had worked for twenty-five years. I formed the desire to investigate more fully the origin of stencil duplicating and find out more exactly the role played by David Gestetner, the founder of the firm. This book is the result of the considerable research which I was given every encouragement to pursue.

Most scientific discovery and industrial invention stems from the step by step efforts of various workers in the field, sometimes simultaneously, but independently, in different lands; all building on available knowledge and responding in various ways to the needs and influences of the time. The historical research undertaken for this particular investigation has

shown that this was the case with the origin of stencil duplicating. Besides David Gestetner there were others who made important contributions to the development of the stencil idea. There was Thomas Alva Edison, for instance, the famous American inventor and electrical genius, and the relatively unknown Eugenio de Zuccato, an Italian law student working in a London office.

The full study of those early days of stencil duplicating confirms and illuminates the outstandingly important part David Gestetner played in this great event in the history of office copying methods. His invention of the Cyclostyle wheelpen in 1881 for writing on a stencil combined with his introduction of a Japanese paper as base for making wax stencils provided the first practical and successful method of duplicating handwriting and started an era of great change in office practice in the late nineteenth century.

In order to understand the nature of this important invention and appreciate the impact it made on the office world of the last century, it seemed to me essential to know about the copying methods used in the Victorian office of the preceding two or three decades. The results of this additional research are outlined in the first chapter of the book, entitled broadly "Before Stencils".

The story of the invention and growth of stencil duplicating is told in two subsequent chapters: "Writing on Stencils" and "Stencils for Typewriting", in which I have attempted to explain the development by understanding the procedures described. I have tried also to appreciate the commercial requirements and human needs that brought them into being.

Having duly credited the various inventors with their contributions, I have examined and assessed in a final chapter the commercial progress of the process with special reference to the business founded by David Gestetner. Called "The Beginning of a New Era", this chapter takes the story up to the beginning of the present century—to the beginning of the new era of the modern office, which the introduction of the stencil process and stencil duplicators had done so much to shape.

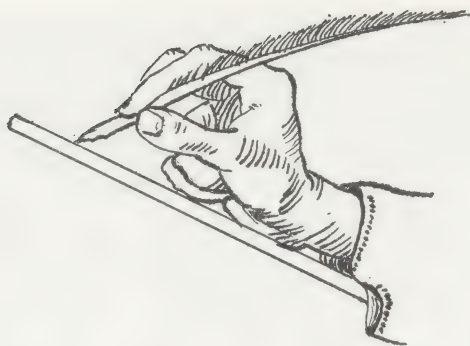
The modern office is so rapidly becoming completely mechanised and sophisticated that soon knowledge of the fundamental changes that made it all possible may be forgotten or lost. I hope, therefore, that by placing on record some of the main events concerned with the introduction of mechanical methods of copying at the end of the last century, this history of the origin of stencil duplicating may prove to be a contribution of some value to all interested in the history of that universal institution, the office.

Someone, of course, will ask "what about printing?" Printing was invented in the fifteenth century and came to be used traditionally in all civilised countries for the production of books, periodicals, newspapers, pamphlets and the infinite ephemera of civic life. But not for the reproduction of commercial records or the daily documents of the office, which until comparatively recently have always been handwritten. Not until some time after the invention and development of the stencil process and

its adaptation to the typewriter was any attempt made to use printing for some of the daily literature of the office. It was then, at about the beginning of the present century, that type-setting machines based on letterpress printing were introduced into the office in an attempt to obtain a still larger number of copies than was possible with the stencil process. But type-setting was time-consuming, more difficult to learn than typewriting, and the capital cost of the equipment was relatively high.

Continued improvements during the first half of the present century in the nature and quality of stencils and in the design and performance of stencil duplicators provided the office with a much more convenient alternative to type-setting machines for its daily 'printing' requirements. And it is with the origin of stencil duplicators that this history is concerned.





BEFORE STENCILS

Long before

In this preliminary chapter the various copying methods used before the invention of stencil duplicating will be described and discussed. They were products and activities mainly of the eighteenth and nineteenth century, and we shall be concerned particularly with those in actual use in the decade during which stencil duplicating made its debut.

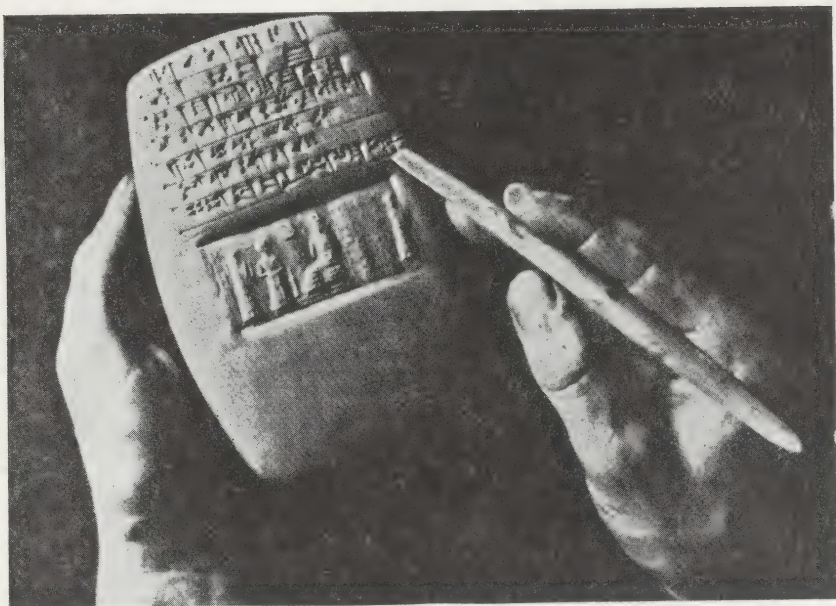
But first a peep into ancient history to look for record of the use of duplicating in the early civilisations.

It is usual to find on such investigation that the Greeks had a word for it, or that the Chinese invented it several thousand years ago. Stencil duplicating, however, remains a unique invention of the nineteenth century A.D.

Mention, nevertheless, should be made of the cylinder seals found among the archaeological treasures of the Babylonian era, for they were used as a means of duplicating signatures on letters and other documents. Babylonians used clay as their writing material and business letters were written, signed, and sealed in the form of small lumps of clay. Most of them were of a size that could easily be held in the hand. The scribes wrote with a small wedge-shaped stick of wood with which they made impressions in the clay while it was soft. The written clay tablet was subsequently baked in the sun. One could not tear up letters in those days: it was necessary to take a hammer to them.

Thousands of such clay tablets representing business letters from offices of Ancient Babylon can be seen in most of the national museums of today. The British Museum has a particularly good collection.

It was common practice to sign Babylonian documents by means of a small cylinder seal rolled over the clay before the baking stage. Such seals



were about one to two inches long and half-an-inch in diameter, and in that affluent age they were made of marble, agate, chalcedony, or other semi-precious stone. The surface was engraved in reverse with all sorts of delightful figures and designs, plus a panel for the owner's name, his father's, the king's, or that of a favourite god.

The seal was propelled over the clay by means of the forefinger and thumb, forming the design in relief, usually at the bottom of the document. Some of the seals had a hole bored axially from end to end in a way that suggests that a small handle could have been inserted to make them into little rollers. Duplicating cylinders? The first rotary duplicators? A tempting conclusion for the historian of office practice to make. But it is more likely that the hole was for threading with string so that the seal could be



worn as an amulet or necklace. It was the Babylonian equivalent of the signature ring used throughout history for impressing seals in wax.

Although clay tablets were always written with the wedge-stylus or stick, they were never signed by means of it. Signing was done with the cylinder seal, and that was the boss's job. Writing was the skilled craft of the scribe, not practised by the boss—any more than typing is today.

There is no evidence that the clay tablets were duplicated or copied by means other than laborious re-writing. Such re-written duplicates of clay tablets do exist. It is necessary therefore to be cautious in citing the use of the cylinder seals of Babylon as an example of early duplicating. They certainly did not provide a means of duplicating or copying handwriting in the ordinary sense.

Copying methods of the eighteenth and nineteenth century

Since those distant days of antediluvian commerce some five thousand years ago, man has been writing prolifically by hand, on papyrus, parchment, or paper as time progressed. So it was with the scribes of Babylon and Egypt; with the stenographers of Greek and Roman times; with the monks of the Middle Ages, and so on to the tally clerks of Renaissance commerce and the office scribblers of the Georgian banks and counting houses. Right up to the copy clerks of Victorian days copying by hand with quill or pen was standard practice. Copy clerks were cheap and there were plenty of them. There was also plenty of time and no need for mechanical aids to help them. And so they remained perched on their high stools at tall sloping desks in dark Dickensian offices, toiling for long hours of drudgery, copying by hand each and every ledger entry and all outgoing letters.

Top Left: A modern imitation of an ancient clay tablet, inscribed and sealed.

By courtesy of the Oriental Institute, University of Chicago (photograph supplied by the British Museum Photographic Service)

Left: Cylinder seal and impression on clay from collection of Babylonian clay tablets at the British Museum.

By kind permission of the Trustees

Right: Clay tablet in envelope.

By courtesy of the Oriental Institute, University of Chicago



Not until the beginning of the last quarter of the nineteenth century do we find mechanical aids to the copying of business correspondence introduced to the general offices of commerce.

But research reveals copying machines and kindred gadgets had been invented and used privately in the early part of the nineteenth century and before that in the eighteenth century—even as early as 1650. What manner of things were they? Who invented them? How did they work? And what commercial needs and economic forces brought them, or some of them, into general use in the late Victorian office? They set the scene “before stencils” and are proper study and title for our next chapter.



But first Mr Hartlib's ink of 1655

In Evelyn's diary the following note appears under the date, 27th November 1655: "I went to see York House. Thence to visit honest and learned Mr Hartlib, a public spirited and ingenious person who had propagated

many useful things and arts. He told me of an ink that would give a dozen copies when moist sheets of paper were pressed on it: and gave me a recipe how to take off any print without the least injury to the original."

The mention of moist sheets of paper clearly suggests that the process anticipated one patented a hundred years later by James Watt of steam-engine fame. This will be dealt with in detail later in this chapter.

It is unlikely that Mr Hartlib's process was ever employed commercially, but it may have been used extensively, in private, by people who liked to patronise useful things and arts in those literary days. Pepys, the other contemporary diarist, seems to have been more concerned with the shorthand abbreviation of his entries than with any method of duplicating them.

John Evelyn has a great deal to say about the learned Samuel Hartlib whom he rated highly as a friend and "as a master of innumerable curiosities". A refugee from Lithuania, he was, nevertheless, a highly respected gentleman in London, well-known as educational reformer and promoter of industrial improvements to the scientists and intellectuals of that day—busy becoming founders of the Royal Society (incorporated 1662). One of them, the Honourable Robert Boyle, the famous English chemist, counted Hartlib his friend; and Milton dedicated one of his tracts to him. It may be that in recording this reference to Mr Hartlib and his ink we should stand up and declare him to be the first inventor of a "modern" copying process.

And Mill's patent of 1714*

In 1714 Queen Anne, "by the grace of God, to whom all these presents shall come greeting" granted to her well beloved subject Henry Mill "our Royal Letters Patent for an artificial machine or method for impressing letters as in writing". The patent thereafter devotes four pages to a description of the virtues and privileges of letters patent in general and the industry and patience of the said Henry Mills in particular, but fails to explain his invention. It goes on about "engrossing all writings whatsoever on paper or parchment so neat and exact as not to be distinguished from print", but one is none the wiser.

Multiple pens

In the late eighteenth and early nineteenth century several ingenious devices were invented in which a master pen or quill held in the hand in the ordinary course of writing was linked by levers to one or more additional pens, which were made to execute the identical writing on separate

* Mill's patent is frequently mentioned in historical accounts of office equipment and methods, but the patent itself sheds little or no light on the subject. It may have been some kind of lettering guide or stamping device, or possibly a primitive typewriting machine. Nobody knows.

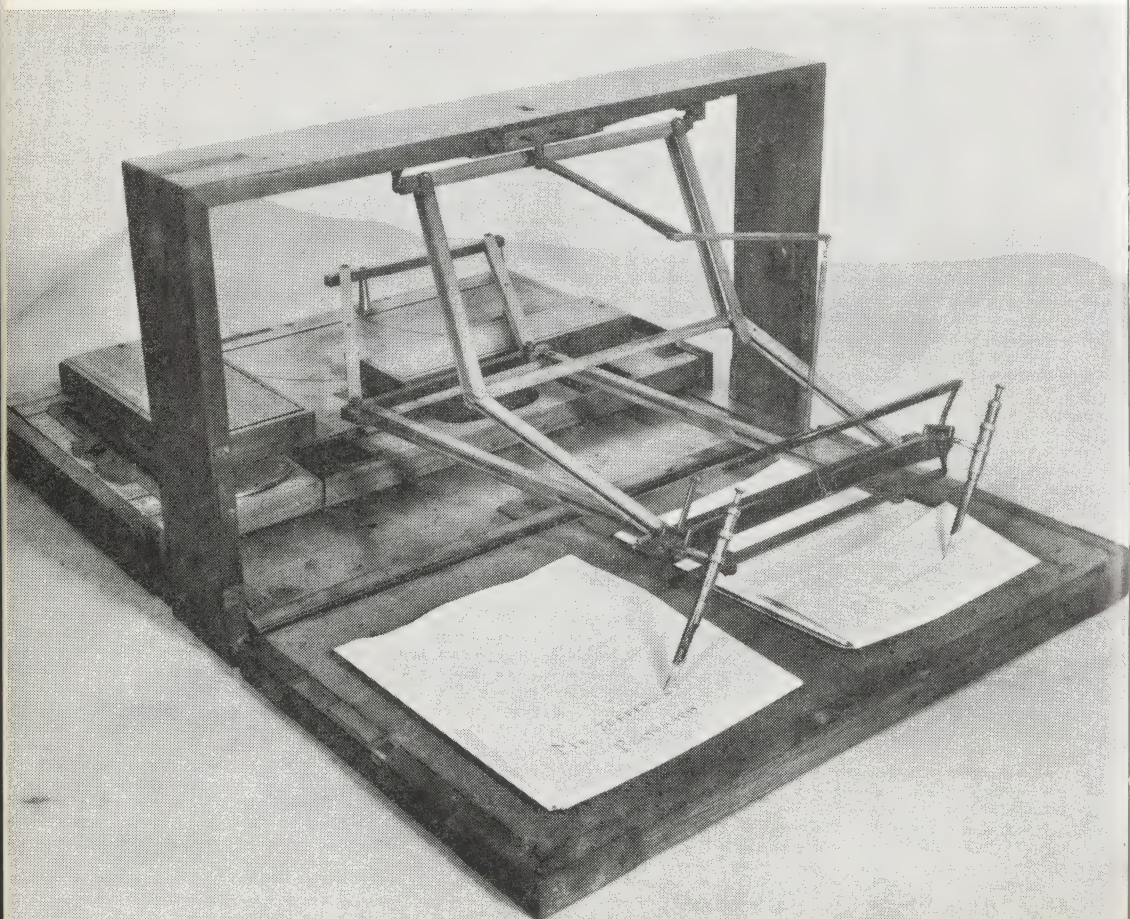
sheets of paper. One such multiple writing machine was patented in 1799 by Sir Marc Isambard Brunel, famous engineer and father of the equally famous Isambard Kingdom Brunel. It employed two quills carried by vertical swinging V-shaped arms on a horizontal wooden frame. Each quill was provided with a separate ink-well so that the quills could be raised and dipped in their respective ink-wells simultaneously. The Science Museum, London, has a beautiful example of this machine as made and used by Brunel himself.

A similar writing machine was invented by a Mr Hawkins of Frankford, Philadelphia, and used by Thomas Jefferson, third president of the United States of America. Thomas Jefferson wrote enthusiastically about it in his diary in 1804: "I think this is the finest invention of the present age. As a secretary to copy for us what we write without the power of revealing it, I find it a most precious possession to a man in public business."

Multiple pens were mainly used by gentlemen for copying their private correspondence. They were not used by office copy clerks, most of whom would have no truck with such new fangled ideas.

Multiple pen as used by Thomas Jefferson, Third President of the United States of America.

By courtesy of the library of the University of Virginia



James Watt's portable copying machine

An outstanding piece of copying equipment of the late eighteenth century was invented, manufactured, and sold by none other than the great engineer, James Watt. The process which this copying machine employed was patented in 1780 as "A new method of copying letters and other writings expeditiously".

For several years before that, James Watt had been travelling back and forth between his Soho works in Birmingham and the tin mines of Cornwall where he was erecting one of his steam engines. There was a large correspondence between him and his partner Matthew Boulton and he found it tedious to copy out by hand the lengthy letters and technical memoranda on mechanical matters involved. Seeing the need for a copying method, he seems, without more ado, to have sat down and invented one, patented it, and built an elegant portable machine on which to apply it.

In the process used on James Watt's copying machine the letter-to-be-copied was written with a special copying ink on a sheet of good quality writing paper and placed, when dry, in contact with a water-dampened tissue-paper. The two were held together for a few minutes in some form of mangle or screw press. The writing which offset on to the tissue gave an impression in reverse, but as the tissue was very thin it was simple to read the writing from the other side where it appeared the correct way round. See illustration page 22.

The writing was dried without blotting or application of heat, and contact with the dampened tissue was best made within twenty-four hours of writing the original. A full prescription or recipe for the ink is described in the patent. The process depended on the nature, quality and freshness of the ink, on the essential thinness of the paper tissue, and on the paper-maker's ability to make it tough and durable when wet.

The portable machine to operate the process was a smart outfit with built-in press rolls, a drawer with a dish of water to keep the dampened tissues ready for use, a china ink-well designed by Josiah Wedgwood, a folding flap for use as an instant writing desk, places for pens and papers, and various other endearing gadgets. An excellent piece of office copying equipment—the first in history. It cost £6 10s plus a guinea for brass corners. The book of instructions issued with it is a first-class piece of technical writing, a model of clarity and attention to detail.

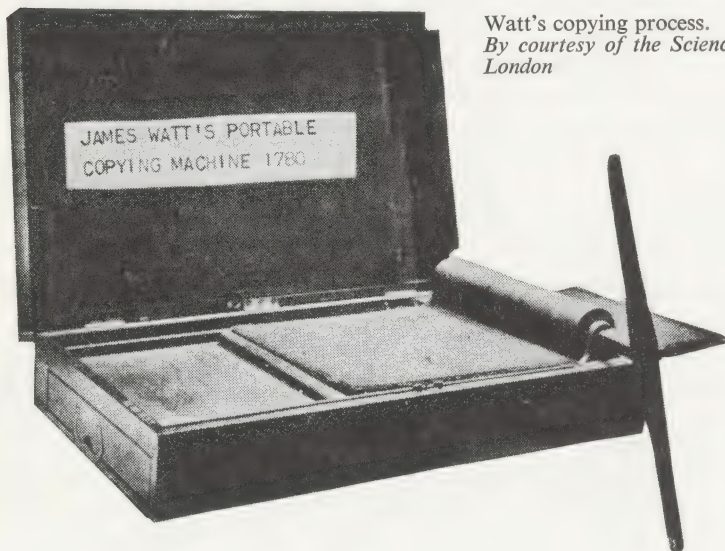
Watt and Boulton formed a partnership with a James Keir to manufacture and sell this novel machine. However, when it was first shown to potential buyers in London, it was not well received, because of the fear that it might be used as an instrument of wholesale forgery. But, in spite of this opposition, a couple of hundred machines were sold throughout the country by the end of the first year of business. The company prospered and James Watt enjoyed fair financial fruit from the venture.

The machines were mainly used privately and were not taken up by

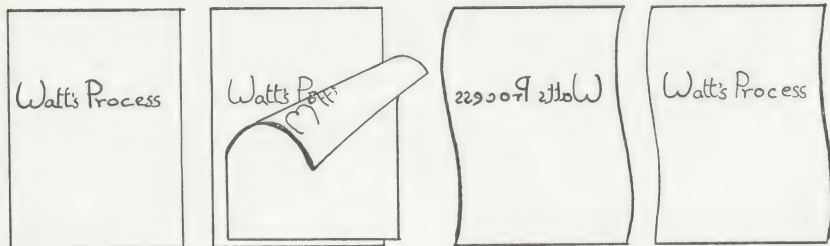
offices as standard copying procedure. But about a hundred years later the principle was applied to an adaptation of the process that did become the recognised method of copying office correspondence. But more of this later—for it depended on several things that in Watt's day had not yet come to pass.

It is likely that Watt's process, based on the use of moist tissues and a copiable ink, was essentially similar to the one mentioned in Evelyn's diary. But it is to Watt that credit must go for establishing the process as a viable and saleable method of making a copy. Watt's patent in any case is probably quite original; for Watt, no doubt, knew nothing of Hartlib's ink.

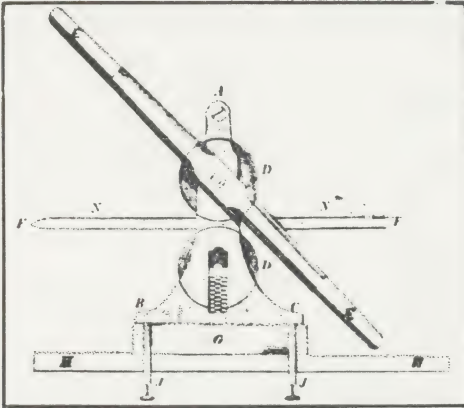
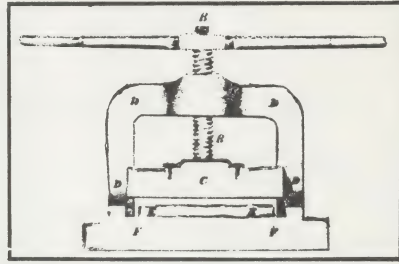
It is fair also to add that in the 1880's the commercial times were ripe for such a process; this was not so in Watt's day, and certainly not in the days of the learned Mr Hartlib.



Watt's copying process.
By courtesy of the Science Museum,
London



How it works: *from left to right*, written original, dampened tissue on top, reversed image of writing offset on underside of tissue, finally seen reading correctly through the other side.



A.D. 1780.—N° 1244.

Watt's Method of Copying Letters, &c.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES WATT, of Birmingham, in the County of Warwick, Engineer, send greeting.

WHEREAS His most Excellent Majesty King George the Third, by His Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Fourteenth day of February, in the twentieth year of His reign, did give and grant unto me, the said James Watt, my exors, admors, and assigns, His especial licence, full power, sole privilege and authority, that I, the said James Watt, my exors, admors, and assigns, should and lawfully might, during the term of years therein expressed, make, use, exercise, and vend, within that part of Great Britain called England, His Dominion of Wales, and Town of Berwick-upon-Tweed, my Invention of "A NEW METHOD OF COPYING LETTERS AND OTHER WRITINGS EXPEDITIOUSLY;" in which said recited Letters Patent is contained a proviso obliging me, the said James Watt, by an instrument in writing under my hand and seal, to cause a particular description of the nature of my said Invention, and in what manner

By kind permission of the Crown Copyright Department and the Science Museum, London

A.D. 1806 N° 2972.

Producing Duplicates of Writings.

WEDGWOOD'S SPECIFICATION.

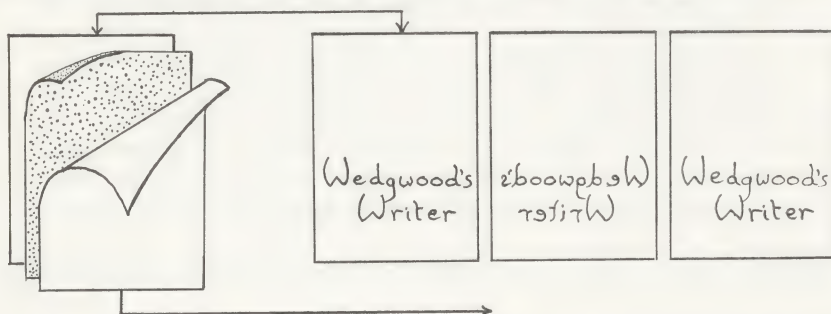
TO ALL TO WHOM THESE PRESENTS SHALL COME, I, RALPH WEDGWOOD, of Charles Street, Hampstead Road, in the Parish of Saint Pancras, in the County of Middlesex, Gentleman, send greeting.

WHEREAS His most Excellent Majesty King George the Third did, by His Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster, the Seventh day of October, in the forty-sixth year of His reign, give and grant unto me, the said Ralph Wedgwood, my exors, admors, and assigns, His special licence, full power, sole privilege and authority, that I, the said Ralph Wedgwood,

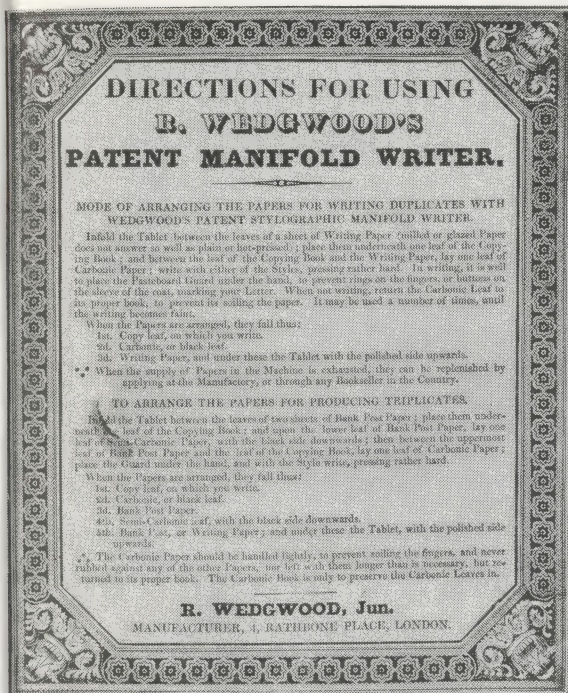
Ralph Wedgwood's manifold stylographic writer

Another interesting and successful apparatus for copying handwriting in the early days of the nineteenth century was Ralph Wedgwood's Stylographic Writer. Ralph Wedgwood was related to the famous pottery family and was descended from Thomas Wedgwood, who was father of Josiah, the founder of the firm. But Ralph was *persona non grata* with the family and did not share its fortune. Delightful but pathetic letters from Ralph Wedgwood in London to his daughter in the country reveal how he had to hawk his copying apparatus round to find the price for his next meal. Necessity is the mother of invention in more ways than one.

A patent for "An apparatus for producing duplicates of writing" was granted to Wedgwood in 1806. In its original form the apparatus was designed as a means of helping blind people to write, with a metal stylus instead of a quill. A piece of paper soaked in printer's ink and dried off was placed between two sheets of writing paper in order to render the writing visible in the form of the copy obtained on the bottom sheet. Horizontal metal wires on the writing-board acted as feeler-guides for the stylus.



How it works: a double-sided carbon is inserted between two sheets of paper, which when written on with a stylus, produces a bottom copy the correct way round and a top copy which can be read through the reverse.



Certificate of Merit issued by
The Royal Institution

A few years later Wedgwood developed the idea into a method of making copies of private or business letters and other documents. These copies were made at the time of writing and relied on the ink-impregnated paper, which was in fact a double-sided carbon. Wedgwood called it carbonic or carbonated paper. Incidentally, it was the first carbon paper of which there is any historical record.

Briefly the idea was to write with a metal stylus on a sheet of paper thin enough to be transparent, using one of the carbon sheets in such a way as to obtain a nice black copy on another sheet of paper placed underneath the carbon. This other sheet of paper was a good quality writing paper and the "copy" on it formed the "original" for sending out. The kept copy was on the underside of the transparent sheet through which it could be read the correct way round. See illustration opposite, and above "Directions for using".

In its final form the Manifold Stylographic Writer was a most elegant presentation consisting of two books of these special papers (the transparent sheets and the "carbons") contained in marbled cartridge-covers.

Both books were housed in a handsome folder containing several styles or styli (some agate tipped), a black lacquered metal writing plate, and some good-quality writing paper. All this and the fact that a copy was retained in one of the books made good reason for calling the assembly "The Manifold Writer" with the word "Stylographic" added to complete the description.

Eventually a company was formed to make and sell this Manifold Writer, and by 1818 it was well established in the name of the inventor's son, R. Wedgwood Jnr, Manufacturer, 4 Rathbone Place, Oxford Street, London. The product and the company seem to have enjoyed a fair success. The Royal Institution in 1829 issued a certificate of merit commending the invention as worthy of public attention, and the Greenwich Observatory in the same year testified to the good use they had made of one of Wedgwood's Writers. An impressive printed copy of the certificate signed by Sir Humphrey Davy and of the testimonial signed by the Astronomer Royal was mounted on the inside of the cover of each Writer as sold.

Although the company seems to have prospered and many Writers were sold, they were not adopted by the general office in commerce. Businessmen preferred their outgoing letters to be written in ink, and seemed also to fear forgery from the facility such copying procedure provided.

At an early stage in the researches on this subject it was noted that many entries in the main catalogue of the British Museum Reading Room (Music Volumes) seem to be hand written carbon copies of a kind that could have been made by Wedgwood's carbonic process. It was interesting, therefore, to find confirmation of this in Arundel Esdaile's *History of the British Museum Library*, in which he states: "The catalogue was made in manuscript; and the titles of all accessions, and by degrees those of older stock, were copied by the Transcribers appointed in 1847 and later years, and reproduced in four copies by the carbonic process." One set formed, as now, a shelf list; the other sets were inserted in the Reading Room and Staff copies.

A change of tempo

During the first half of the nineteenth century Brunel's pens, Watt's machine, and Wedgwood's Writer remained interesting apparatus of limited, private application, and the commercial office did not adopt them as general copying equipment. And so the copy clerk of that period was still to be found pushing his pen without any mechanical aid.

But about the middle of that century, chiefly in Great Britain and the United States of America, the tempo of commerce and industry began to increase rapidly. Great Britain was extending her commercial empire throughout the continents of Africa, Asia, and Australia. It was the time of the Great Exhibition in Hyde Park, London, in 1851, sponsored by Albert, the Prince Consort, champion of Great Britain's industrial prowess

and encourager of the arts, sciences, and commerce. And the New World in North America was rapidly becoming the industrial miracle of the age.

During this period of increasing pressures on the office, Watt's copying method came into wider use in the form of the letter copying book process, an adaptation of the original invention which became standard office practice for the remainder of the nineteenth century, and indeed well into the present century. Its success owed much to the availability of copying inks made with aniline dyes, which had been discovered in 1856.

Later in the eventful seventies, carbons, first used in Wedgwood's Writer, came into general office use through a development quite independent of the Wedgwood invention. This second appearance of carbons in the history of office copying methods was closely associated with the development of the typewriter and its adoption by commerce.

It was also in the 1870's that a method of making copies from a gelatine pad, called hectograph, came into use. This also owed its success to the availability of copying inks made with aniline dyes. It is important therefore to take a closer look at these three copying methods: the letter copying book process, carbons, and hectograph, which were in general use shortly before the invention and introduction of the stencil process.

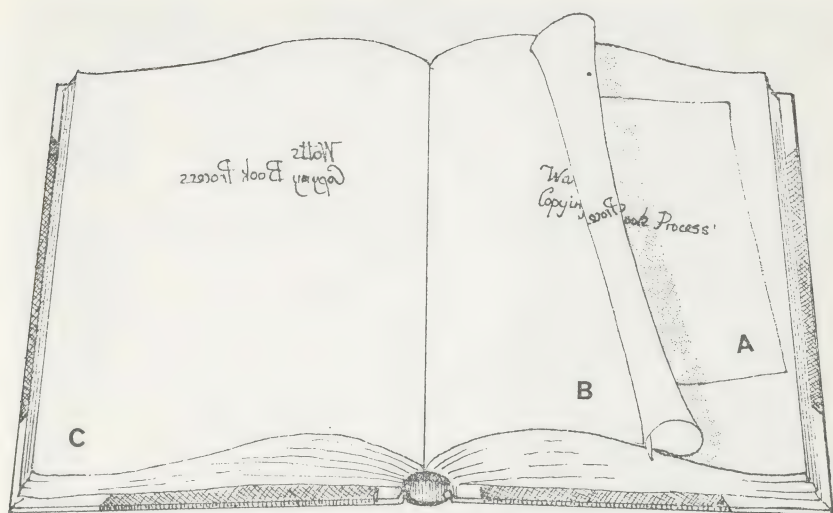
The letter copying book process

The letter copying book process was a direct development or application of Watt's idea of making copy by means of a dampened tissue placed in contact, under pressure, with the freshly written and recently dried original. The copying book consisted of tissues, up to a thousand, serially numbered and bound in a handsome leather-spined volume with index.

Copy was made by dampening the tissue *in situ* with water from a brush or by means of a cotton cloth soaked in water and placed flat on top of the tissue. See illustration opposite. These cotton cloths with serrated edges and coloured blue were as familiar in the Victorian office as pink string and sealing wax.

Sheets of oiled paper were used to insulate the wet tissue from adjacent dry tissues in the book. After insertion of the letter-to-be-copied, the whole book was closed and placed for half-a-minute or so in a screw press with big cast iron platens and turning handle. The handsome screw press, black-lacquered and elaborate with gilt ornamentation, became a familiar piece of equipment symbolic of the late Victorian office.

The letter copying book, as such, was comprehended in Watt's original patent and, in conjunction with the original screw type of press, had been used throughout the earlier part of the nineteenth century for the copying of private correspondence. But it was the portable copying machine that the Watt company was chiefly interested in selling: the book process did not become popular until the period with which we are now dealing.



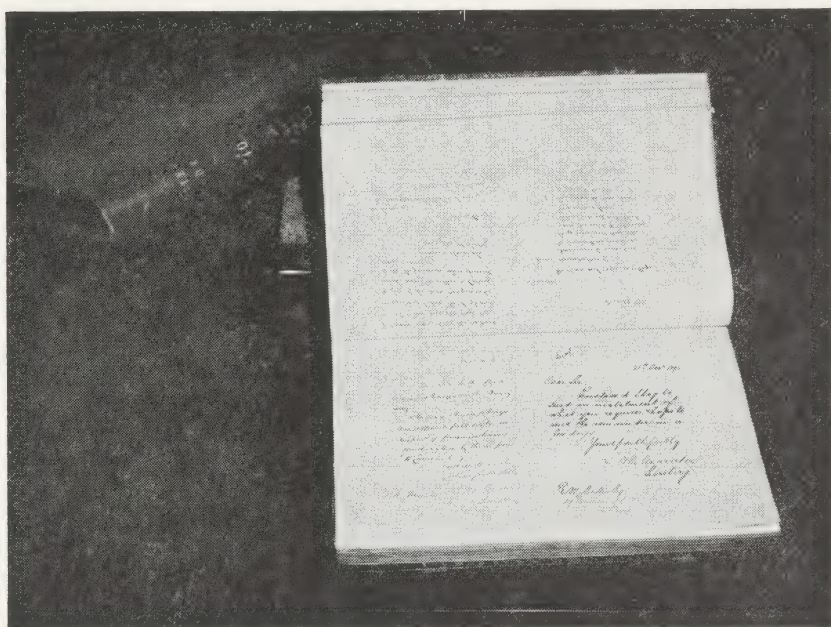
How it works: **A** the written original, **B** dampened tissue turned back, **C** previously processed tissue.

The adoption of the letter copying book as standard office procedure (about 1875) resulted from the urgent need for mechanical aids in the office, and also from the introduction of chemical dyes in the manufacture of inks—the aniline dyes already mentioned. The production of special copying inks then became possible for the first time.

It was not easy to obtain good copy with ordinary writing inks, and to make more than one copy from one draft was quite impossible, even with Watt's special, so-called, copying ink. But aniline dyes, violet or blue and strong in colour, made the transfer easier: and with care more than one copy could be made. The violet coloured copy soon became characteristic of the process in its new form and copying inks and copying pencils became the new writing materials of the stationers' shops.

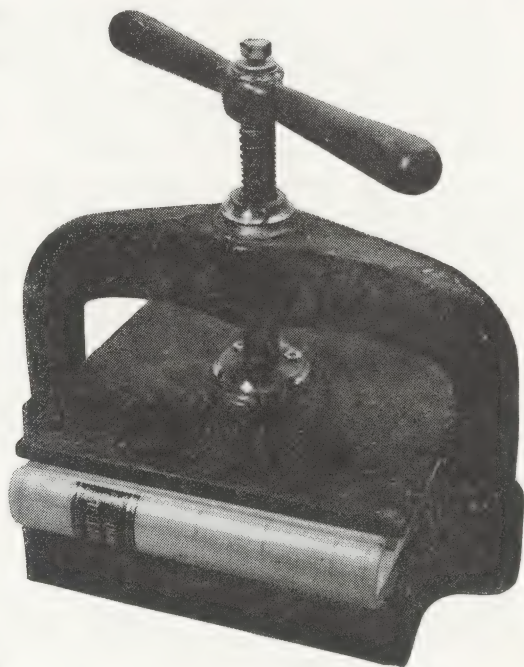
It was a remarkable historical coincidence that when the time was ripe for the process to develop, the means to make this possible came along in the form of the independent discovery of the necessary dyes. The first of these aniline dyes, mauvine, was discovered by William Perkin, a British chemist, in 1856, and by the 1870's a vigorous dye industry was established.* But it was from Germany that most of the patented copying inks came.

* This was the first ever artificial dyestuff; previously, civilisation depended on nature's colouring materials: madder, indigo, cochineal, logwood, of vegetable or animal origin. Perkin was only eighteen years of age when he made his momentous discovery in his home-made laboratory in London. He gave up a college post to start a factory and inaugurate the dye industry which, however, flourished at first in Germany, not Britain.



Letter copying books still in use
in the 1950's.

*By courtesy of the Law Society,
Chancery Lane, London*

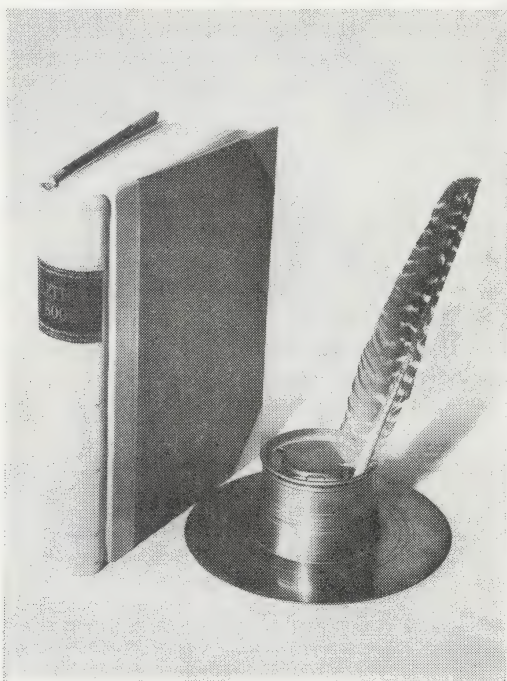


The familiar letter copying press.

Another historical coincidence, unexpectedly promoting progress of a process ripe for development, was the importation of Japanese papers from the Far East for the first time and their application as copying papers in the letter book. That occurred round about 1868. Japanese copying papers became very popular as strong, thin, transparent papers which could "take" ink.

With the copying book process properly organised it was customary to copy two dozen or more letters at once by putting them with the necessary cloths into the book and insulating the lot with a couple of oiled sheets. Considerable skill was required to avoid spoiling the original letter which had to be afterwards put in an envelope and sent off. Nevertheless great dexterity was acquired by the office boy with an eye on the Victorian clock as he "knocked off copies" in time for the afternoon mail. He could operate the letter copying book with speed and produce copies of a quality that would put to shame many a modern, fully automatic all-electric office copier. And by skilful manipulation of the cloths and tissues he could copy a letter written on both sides of the sheet and obtain the copies simultaneously. Short letters were arranged two-up on a page and various other dodges were employed in the everyday practice of this well established office copying process.

The letter copying book process continued in use far into the twentieth century and there must be many people alive today who can remember it



Symbols of the early Victorian office.

as the recognised way of making copies of correspondence. Outgoing correspondence, only, please note—the luxury of making copies of incoming letters is a development of very recent times.

Not only was the letter copying book in everyday use in the office, it was commonly used also in the home for copying the domestic correspondence of the business-like house-owner.

In the legal world it was especially liked and was used by solicitors in the courts right up until a few years ago. The Law Society, of Chancery Lane, London, was still using it in the late 1950's. The letter copying book could be produced in court, as evidence, since the copy therein was accepted as a true and permanent copy of the original; indeed, as a holograph. Carbon copies, more familiar to most of us, and the subject of our next section, never enjoyed this favour.

Carbon copies

Independently of Wedgwood's product, carbons are sometimes mentioned as first appearing in France. But it was in the United States of America that their association with the typewriter was established and their place in general office practice ensured.

Carbons, consisting of paper coated with oil and carbon black after the manner of Wedgwood's invention, were made as early as 1823 by a certain Cyrus P. Dakin of Concord, Massachusetts, who seems to have sold them for the exclusive use of the Associated Press.* Some forty years later in 1868 in Cincinnati the same Associated Press was covering the balloon ascent of an intrepid aeronaut engaged in a celebration stunt for the biscuit and greengrocery firm of which he had just been made a partner on his twenty-first birthday. Lebbeus H. Rogers was his name; during an interview in the newspaper offices after the flight he happened to see Dakin's carbons and immediately saw the possibility of their application to the copying of office documents.

He got himself so fired by this idea that he gave up ballooning and the biscuit business and went into orbit on the manufacture of carbon papers for office use.

Rogers' carbons, however, were not much used for making copies of handwritten letters in the ordinary course of business. It was not easy to make carbon copies of letters written with a quill pen because of the inadequate pressure. And, in any case, the businessman in those days of calligraphic excellence preferred the outgoing letter to be written in ink, a point we have noted already in connection with the original Wedgwood carbons. Carbons for that reason were not popular for correspondence copying and were used more for duplicate and manifold books, order

* This account of the origin of the familiar office carbon comes from the archives of the Kee Lox Carbon Paper Company of America in the form of a document with the curious title "The Scandalous History of Carbons".

books, receipt books, bills of lading, and so on—important business applications nevertheless, and ones in which the carbon is still indispensable in present day practice.

But with the coming of the typewriter, carbons found a new and still more important role in the “modernised” office of the late nineteenth century. The first demonstration of a practical typewriter for commercial office use, the Sholes and Glidden typewriter, was made in 1872 in the New York offices of E. Remington and Sons, Gunsmiths and Sewing Machine manufacturers, who in the following year set up a separate department for the production of this remarkable instrument.

THE TYPE-WRITER!

A Machine to Supersede the Pen.

MANUFACTURED BY
E. REMINGTON & SONS,
ILION, N. Y.



SOLD BY
Remington Sewing Machine Co.
BRANCH OFFICE,
258 West Jefferson St. Louisville, Ky.

Price, \$125

Ministers, lawyers, authors, and all who desire to escape the drudgery of the pen, are cordially invited to call at our office, and learn to use the Type-Writer. Use of machines, paper and instructions, **FREE!**

THE TYPE-WRITER.

COPYING.

A special department has been set apart for this purpose, and we are now prepared to do all kinds of copying, in the best manner, on the TYPE-WRITER. Any number of copies—from one to twenty—of any document, can be taken **AT THE SAME TIME**; ensuring *exact duplicates*, and obviating the necessity of more than a single comparison with the original.

The Work is Plain as the Plainest Print.

No pen-writing can compete with Type-Writing, either in
SPEED, LEGIBILITY, OR PRICE.

STENOGRAPHERS

Can come to our office and dictate to operators, from their *short-hand notes*, and thus save the labor of transcription.

AUTHORS,


Who do not desire their manuscripts to go out of hand, can also dictate directly to operator; which saves the labor of revising and preparing a legible first copy for copyist, as such revision can be made when dictating to operator.

DRAMATIC WRITERS

Will see the benefit of our *manifold copying*, in the fact that we can furnish at the *one writing* a **COMPLETE CAST** for every actor.

Any person, within the city limits of our territory, having copying to do, may notify us of the same by postal card or otherwise, and we will promptly dispatch a competent person to the office or residence designated, who will give full particulars, estimates, prices, &c.

THE TYPE-WRITER.



WHAT “MARK TWAIN” SAYS ABOUT IT.

Hartford, March 19, 1875.

GENTLEMEN: Please do not use my name in any way. Please do not even divulge the fact that I own a machine. I have entirely stopped using the Type-Writer, for the reason that I never could write a letter with it to anybody without receiving a request by return mail that I would not only describe the machine, but state what progress I had made in the use of it, etc., etc. I don't like to write letters, and so I don't want people to know I own this curiously-behaving little joker.

Yours truly,
SAML. L. CLEMENS.

WHAT GOV. HOWARD, OF R. I. SAYS.

Providence, R. I., March 27, 1875.

GENTLEMEN: We have now had the Type-Writer about a month, and are entirely satisfied with it. There can be no doubt in regard to its usefulness. When I saw the advertisement of the machine originally, I had little faith in it. An examination surprised me, but not so much as the practical working has. We have no trouble whatever with it, and it is almost constantly in operation. I think that it must rank with the great beneficial inventions of the century.

Very truly yours,
HENRY HOWARD.

From an early brochure issued by the Remington Sewing Machine Company, Louisville, Ky. USA.

Lebbeus Rogers attended the demonstration, persuaded the typist to include his carbons, and astonished everybody as the typewriter began to tap out one, two, three, or more “carbon copies” with the greatest of ease at the same time as the original letter. This production of a good copy simultaneously with the preparation of a good original was an outstanding step in the history of copying. It depended on the adequate pressure of the type to give both. With handwritten work a pen or pencil might give a good original, but not a good copy; and although a metal stylus could

give a good black copy, the original was not so readable.* The typewriter, however, gave eminently acceptable originals and copies, and carbon copying on the typewriter progressively became standard practice in the office.

Rogers' early method of producing carbon paper consisted of applying the mixture of carbon black and oil in naphtha (a solvent) to sheets of paper laid out on a stone table, using a wide brush. He formed a company to manufacture the product. The company prospered and developed the first carbon-coating machine, and introduced the use of hot wax applied by rollers to replace the messy oil impregnations applied by brush. In this way modern one-sided carbons came to be made in a wide range of quality.

Rogers died in 1932, but he lived long enough to see his pioneering efforts established as a flourishing industry. He seems to have been quite a character. He owned a ranch in Nevada, wrote sonnets, and invented a machine for encasing wire cable in lead; all this in addition to his carbon invention and manufacturing interests.

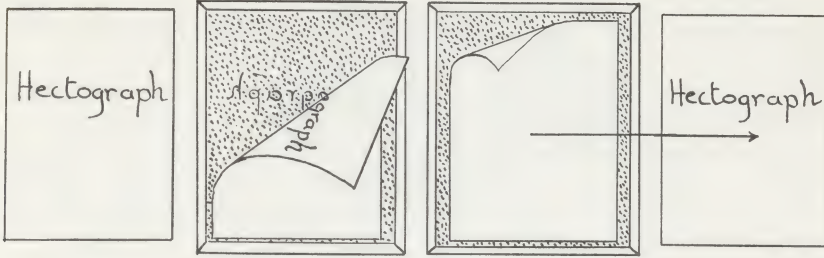
Hectograph

Many older people of today may remember the handwritten examination papers of their schooldays copied in varying shades of purple by the process called hectograph, and some of them in schools or offices may even have prepared and used the gelatin tray which was its centre-piece.

Copying by this process was achieved by writing on a sheet of good quality writing paper with a strong ink containing an aniline dye and placing it (shortly after the writing was dry) face down on a layer of gelatin in a shallow tray. The ink image which formed on the gelatin surface was kept moist because of the humectant or moisture-retaining properties of the gelatin, and copies were made on ordinary sheets of paper pressed by hand or roller on to the gelatin surface. See diagram opposite.

Many copies could be obtained from one image on the gelatin; until the dye was exhausted and copies became too faint to read. Purple dye was popularly used and became the characteristic colour of the process.

* The quill, of course, had begun to give way to the steel pen about the middle of the nineteenth century. The first steel pens were hand-made by Wise of London in 1803, but they were not a commercial success until between 1820 and 1840 when Joseph Gillott and others in Birmingham began manufacturing them from steel sheets using machinery. Steel nibs at a penny a dozen for fitting into metal holders in wooden stems then began to rival the quill; but the changeover took a long time and the quill was still in use in the late nineteenth century. And the quill rather than the steel pen remained the symbol of the handwriting age. First introduced in the laborious days of copying manuscripts in the monasteries about the seventh century, the quill was the civilised world's writing tool for a thousand years or more. It was not used by the Greeks or Romans as is sometimes carelessly assumed from the fact that the word pen comes from *penna*, the Latin for a quill or feather. See "Pens throughout the Ages" on page 60.



How it works: *above left to right*, written original, then placed face down on gelatin, copy paper replacing original, final copy pulls off.

The apparatus shown below is of much later date than the 1880 period concerned with the beginnings of the process. Neither the word duplicator nor the idea of duplicating as distinct from copying was in use in the 1880's.



The gelatin layer was obtained by dissolving gelatin in hot water and pouring the solution into a shallow tray where it was allowed to set. The solution was a good bit stronger than that used for a table jelly.

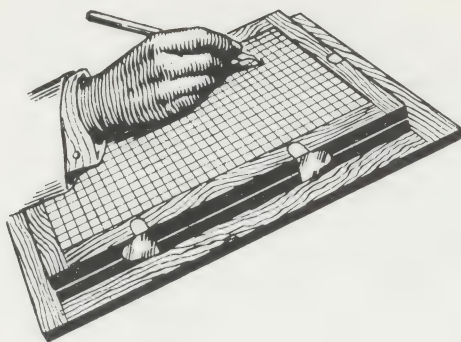
There is no outstanding name associated with the origin of the gelatin process. It was probably tried out in the days before aniline dyes came to be used in colouring inks. At that time it was known simply as the graph and was probably not very successful because of the difficulty of getting more than one good copy when used with ordinary writing inks, or even Watt's special copying ink. It was the deep purple of the aniline dye inks that made the process popular and gave it the new name hectograph after the manufacturers' claims that a hundred copies could be made from one image on the gelatin (*hekatón* being the Greek word for a hundred). Relative to the old graph process the claim was fair enough, but in practice copies became faint long before the hundredth. Polygraph* was another more modest description.

These aniline-dye inks began to appear frequently in the patent literature of the late 1870's. This gives an approximate date for the beginning of the gelatin process in its hectograph form and establishes it as more or less contemporary with stencils. It was probably more popular at that time in Germany where the dyes were made and where its introduction was associated with the name of Alexander Schapiro. In Germany the process was known originally as Schapirograph.

The full history of the hectograph is a separate subject beyond the scope of this investigation, but two points should be made. First of all it should be realised that although the hectograph began its career in the late 1870's, it was not until the beginning of the twentieth century that it became popular and widely used in schools, offices, and homes.

The other matter concerns the development very much later, in 1923, of a modification of the process which is well known today as spirit duplicating. It was introduced by Wilhelm Ritzerfeld, founder of the Ormig Company, in Germany, the original home of the hectograph. Spirit duplicating today is sometimes referred to somewhat erroneously as hectograph after its ancestor the gelatin process.

* The word polygraph has been variously used throughout the history of copying. Jefferson called his multiple pen a polygraph: and early lithographs were sometimes advertised as polygraphs.



WRITING ON STENCILS

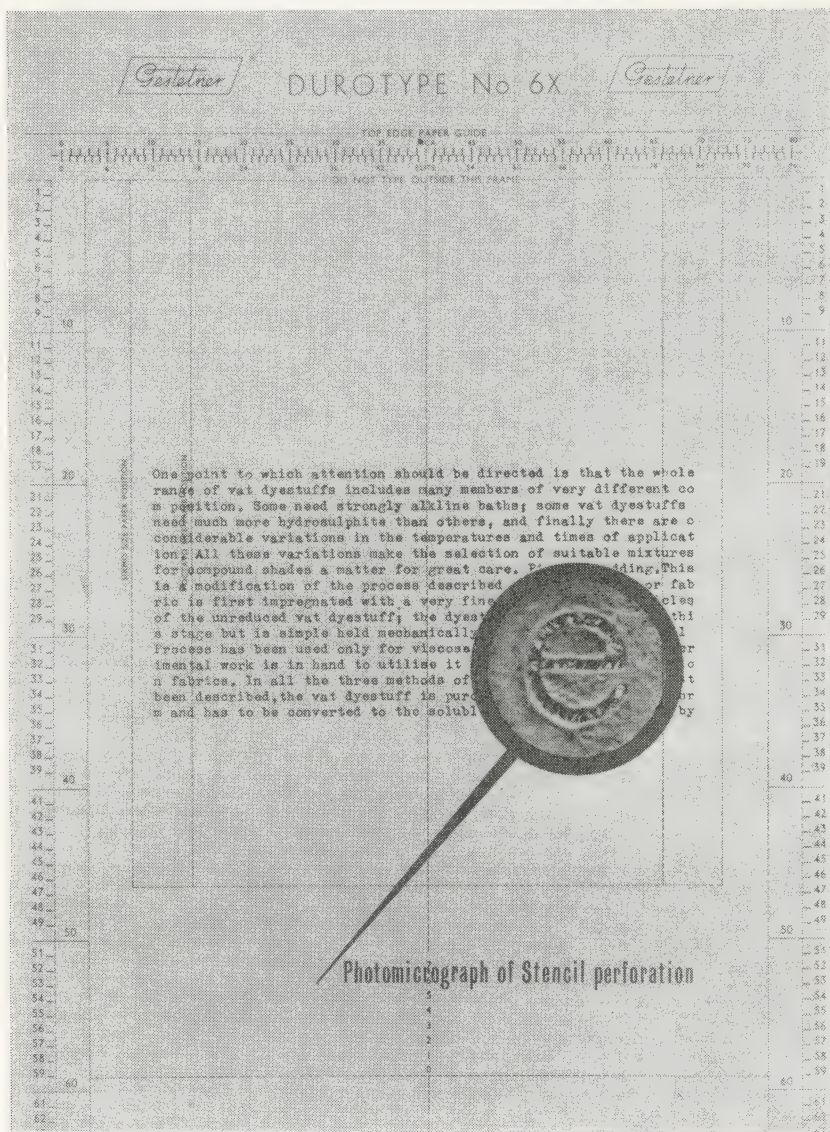
From copying to duplicating

The continued rapid growth of commerce in the 1870's created a need in the office for some means of making larger numbers of copies of handwritten documents than the one or two provided by the letter copying book. It was still a handwriting age in spite of the typewriter, which was to require another two decades properly to tap its way into the Victorian office.

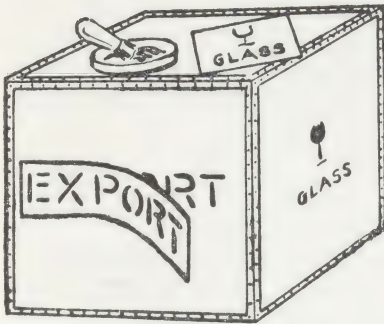
Great events in the social and economic history of Great Britain's commercial and Imperial empire were occurring at that time, when Victoria was "widow of Windsor" and "half of creation she owned", and Gladstone and Disraeli were fighting it out in the political arena. It was also a period of great invention and innovation: the typewriter in 1872; the telephone 1876; electric light and power 1880; all making great impact on the office of the time.

In business administration the limited liability companies were replacing the old family firms, with a consequent increase of enterprise and expansionist policy. New kinds of business and the need for new methods of communication were on the move, making ever increasing demands on the office. Merchants and distributors were accumulating information which they urgently wished to circulate. The idea of the circular letter was emerging.

Banks, railways, solicitors, estate agents and all the other concerns that mushroom into existence and grow with an expanding economy had new needs for preparing and distributing handwritten literature to promote business. Her Majesty's Stationery Office also had much need to multiply departmental documents, and likewise municipal government offices throughout the country.



An enlargement of a typed "e" which shows how the paper tissue holds the character together.



A stencil lettering guide which has to break letters such as P and O to prevent their centres from falling out.

The hectograph in the late 1870's had gone some small way towards meeting this need. In producing copies in number from a master copy, hectograph made the transition from copying to duplicating. It was a simple enough process but inclined to be rather colourful and messy; often the office boy's daily disaster.

There was, more than ever, in the seventies an urgent need for a clean and reliable method of producing a master-sheet by the act of writing, a master-sheet from which a really large number of copies on more or less ordinary paper could be made simply and quickly.

And so it came about that one or two persons of inventive turn of mind in the 1870's began poking holes in pieces of paper to form patterns through which they could push ink or dye and make copies. A sheet of plain paper, or paper coated with wax or some other material impervious to ink, was used.

When such a piece of paper was perforated by a puncturing instrument held in the hand like a pen, an ink-passing image of the writing was obtained in the waxed paper forming a master called a stencil. The centres of o's and loop letters like p's and q's were held in place by the fibres of the paper or tissue which was the basis of all duplicating stencils used for writing (and later typewriting).

Readers may be more familiar with the cut-out metal or plastic stencil used as a lettering guide in packaging and store-keeping for rolling or brushing marks, letters, or designs on to packing cases or other objects. This is quite different fundamentally from a duplicating stencil especially in respect of the loop letters such as p's and q's which have to be cut in two sections to prevent their centres from printing solid black. The artist's or draughtsman's stencil is another of this kind.

Stencil duplicating came into being with the invention of the instruments for writing on these sheets of waxed paper and perforating them. The real breakthrough came with David Gestetner's invention of a toothed wheelpen for writing on waxed stencils and with his recognising the value of Japanese paper as a base tissue for making them.

Stencils prepared in this way provided a means of duplicating handwriting in the large numbers required by the office of the late Victorian period. It was a do-it-yourself kind of printing sometimes called autographic printing—an inspired description, especially when one considers that traditional printing was never adapted to the reproduction of handwriting.

Origin of the word stencil

The origin of the word stencil is much older than the idea of the duplicating stencil and is associated with the other kind of stencil, the cut-out in metal or wood. This was used in the Middle Ages in the early days of the textile industry for brushing colour patterns on to cloth.

The word referred originally to the cut-out piece of metal, the bit removed. In the Middle Ages such bits of tin were used as ornamentation at village fairs when hung up to sparkle in the sunshine or candlelight.

Estenceler was the old French word “to sparkle” and that in turn came from the Latin *scintillare*. “Estencele” by juggled spelling became “stencil” and also “tinsel”. Stencil became the word for the cut-out, patterned, or lettered sheet, while tinsel became the word for the bits of metal—the tawdry bits of tin. The word tawdry comes from the use and sale of such tinsel at St Audrey’s Fair. For St Audrey soon became tawdry for short and remained so for ever.

It is a remarkable feature of the history of office copying and duplicating methods that, although the later and highly sophisticated forms have resulted from the research and development by scientists and technical people, the basic idea and essential practical detail of operation were invented by non-scientists—law students, office clerks, and stationers’ assistants and the like. These lay inventors were in close touch with the swiftly changing needs of the office of their day.

The Papyrograph

In 1871–2 Eugenio de Zuccato, a law student from Padua, working in London, turned his attention to the need for a method of making multiple copies of handwritten legal documents. He proceeded in 1874 with a British patent for a complicated process of making copies in which a sheet of thin paper coated with an ink-impermeable lacquer was written on with a steel-nibbed pen, using a solution of caustic soda in place of ink. The caustic soda (a corrosive chemical) softened the lacquer along the lines of writing so that on pressing the written sheet between water-wetted blotting papers, the partially dissolved lacquer was more or less effectively removed, thus forming a lacquer-free pattern of the handwriting.

Zuccato called the process Papyrograph and entered into a business arrangement with Wolff, a stationer, forming the company Zuccato and

Producing Facsimile Copies of Writings, Drawings, &c.

LETTERS PATENT to Eugenio de Zuccato, of Padua, in the Kingdom of Italy, and of Frith Street, Soho, in the County of Middlesex, in the Kingdom of Great Britain, Licentiate of the University of Padua, for the Invention of "**IMPROVEMENTS IN PRODUCING FACSIMILE COPIES OF WRITINGS, DRAWINGS, AND DELINEATIONS.**"

Sealed the 19th February 1875, and dated the 15th September 1874.

I suggest that the position of the papyrographic paper be occasionally changed while on the wet pad.



The effect produced by the washing before described is to remove such portions of the varnish as have been acted upon or corroded by the action of the papyrographic ink along the lines of the writing, drawing, or delineation which have been made, thus forming a porous paper "stencil." It is next necessary to form a printing pad by saturating with coloring matter held in solution a piece of cloth or a piece of some similar substance, which must be cut slightly larger than the space occupied by the writing, drawing, or delineation that has been executed on the papyrographic paper, while it must be smaller than the area of the said papyrographic paper, which must extend beyond its edges. I

An extract from Zuccato's patent.

The Trade Marks Journal entry on papyrograph.

TRADE MARKS JOURNAL.

[October 10, 1877.]

| Trade Mark. | Name, Address, and Calling of Applicant. | Class of Goods. | Description of Goods. | Number given by Registrar. | Date of Application received. | If Mark used prior to 13th August 1875, how long used. |
|---|--|-----------------|---|----------------------------|-------------------------------|--|
|  | EDWARD WOLFF, of and on behalf of the Firm of ZUCCATO and WOLFF, 19, Charterhouse Street, London; Manufacturers. | 39 | Printing Apparatus, Black and Coloured Writing and Printing Inks and Paper in connection therewith. | 12,390 | 20th June 1877. | One year before 13th Aug. 1875. |
|  | ANDREW BOYS CASELS, Oporto, Portugal; Wine Merchant. | 43 | Wine. | 12,397 | 31st June 1877. | Four years before 13th Aug. 1875. |

Wolff, in whose name the word Papyrograph was entered in the *Trade Marks Journal* of 1877. Although it must have been a difficult and messy process, it was used, nevertheless, in offices in both Great Britain and the United States of America during the 1870's and 1880's. Several advertisements for the process have been found in trade journals of the period in both countries.

Page 41 includes a reproduction of an extract from Zuccato's patent which shows how the lacquered or varnished sheet, called the papyrographic paper, after removal of the varnish "along the lines of writing", is said to form a porous paper "stencil". This is the first recorded use of the word "stencil" in connection with the reproduction of handwriting.

Biographical detail about this young law student from Padua, Eugenio de Zuccato, is scarce, and research remains to be done to discover his origin, background and subsequent history.

In a final assessment one must conclude that the Papyrograph was only a primitive form of the stencil idea. But other minds were at work on the subject and improvements were on the way.

The Electric Pen

In the same years that Zuccato was busy inventing and developing the papyrographic process, Thomas Alva Edison, the great American inventor and electrical genius, invented an electrically operated writing instrument featuring a reciprocating needle so mounted that it could be held in the hand like a pen and used to "write" holes in paper in the pattern of handwriting. He probably got the idea from the use he made of perforated paper in transmitting signals in his telegraphic work at his famous laboratory, then at Menlo Park, New Jersey. In 1872 he had already obtained a patent for a key-operated punch for making perforated paper of that kind.

A patent for this electric pen, as this reciprocating needle came to be called, was applied for in the United States of America in 1876 and was granted on the 8th August of that year. Some nine months earlier in 1875 Edison had lodged an application in Great Britain for the same idea and it was also granted in 1876.

The electric pen consisted of a pointed metal tube within which was a needle fastened to the end of a shaft, which in turn was connected to a small electric motor on top of the tube. The motor was the means of setting the shaft with its needle into extremely rapid, reciprocating motion.

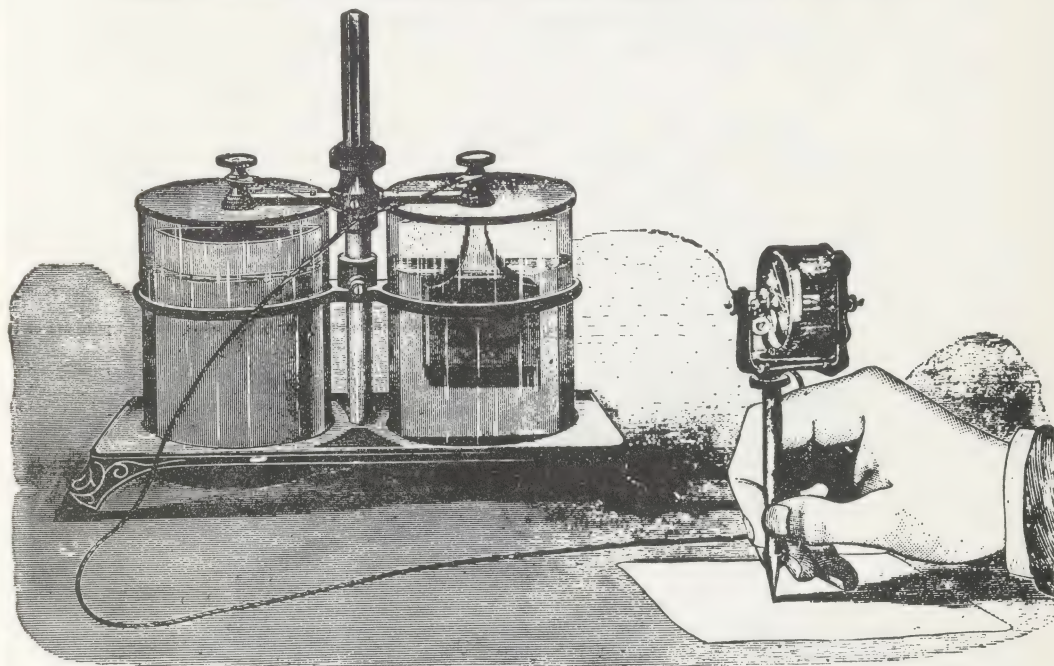
Opposite: As illustrated in a pamphlet found at the Edison National Historic Site, New Jersey, USA.

Reproduced by kind permission of the Trustees

EDISON'S ELECTRIC PEN and PRESS

5000

COPIES FROM A SINGLE WRITING.



THE ELECTRIC PEN AND DUPLICATING PRESS

Was invented three years ago. Many thousands are now in use in the United States, Canada, Great Britain, France, Germany, Russia, Australia, New Zealand, Cuba, Brazil, China, Japan, and other countries.

Stencils can be made with the Electric Pen nearly as fast as writing can be done with an ordinary Pen. From 1,000 to 15,000 impressions can be taken from each stencil, by means of the Duplicating Press, at the speed of five to fifteen per minute.

The apparatus is used by the United States, City and State Governments, Railroad, Steamboat and Express Companies, Insurance and other Corporations, Colleges and Schools, Churches, Sabbath Schools, Societies, Bankers, Real Estate Dealers, Lawyers, Architects, Engineers, Accountants, Printers, and Business Firms in every department of trade.

It is especially valuable for the cheap and rapid production of all matter requiring duplication, such as Circulars, Price Lists, Market Quotations, Business Cards, Autographic Circular Letters and Postal Cards, Pamphlets, Catalogues, Ruled and Blank Forms, Lawyers' Briefs, Contracts, Abstracts, Legal Documents, Freight Tariffs, Time Tables, Invoices, Labels, Letter, Bill and Envelope Heads, Maps, Tracings, Architectural and Mechanical Drawings, Plans and Specifications, Bills of Fare, Music, Insurance Policies, Cypher Books, Cable and Telegraphic Codes, Financial Exhibits, Property Lists, Manifests, Inventories, Schedules, Shipping Lists, College and School Documents, Rolls, Examination Questions, Examples, Illustrations, Scholars' Reports, Lecture Notes, Regulations, Blanks, Official Notices, Mailing Lists, Committee Reports, Sermons, Lectures, Pastoral Information, Manuscripts, Journals, Facsimiles of Papers, Drawings, Hieroglyphics, Programmes, Designs, etc.

Circulars prepared with the Electric Pen pass through the mails as third class matter at one cent per ounce or fraction thereof. Additional information and samples of work furnished on application.

| | |
|---------------------------------------|----------|
| PRICES—No. 1 Outfit, with 7×11 Press, | \$40.00. |
| “ 2 “ “ 9×11 “ | 50.00. |
| “ 3 “ “ 9×14 “ | 60.00. |

Sent C.O.D., or on Receipt of Price.

GEO. H. BLISS, GENERAL MANAGER, 220 TO 232 KINZIE STREET, CHICAGO.

LOCAL AGENCY, 142 La Salle Street, Chicago.

DOMINION AGENCY, 44 Church Street, Toronto, Ont.

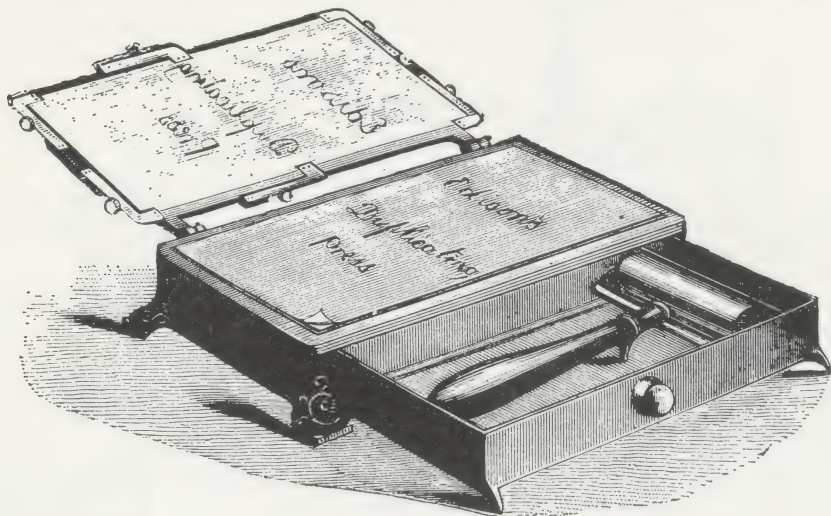
PHILADELPHIA AGENCY, 628 Chestnut St., Philadelphia.

GEN'L EASTERN AGENCY, 20 New Church St., New York.

The vibrating pen was held in the hand, as far as possible like an ordinary pen, and used for writing on paper, placed for the purpose on a sheet of blotting paper laid on some hard, flat surface.

The power to drive the motor was obtained from a battery which was especially designed and manufactured by Edison for use with his electric pen. Incidentally, this was the first electric motor and associated battery ever to be manufactured and sold as a working unit.

The patent also describes a duplicating apparatus with "stencil-holding"

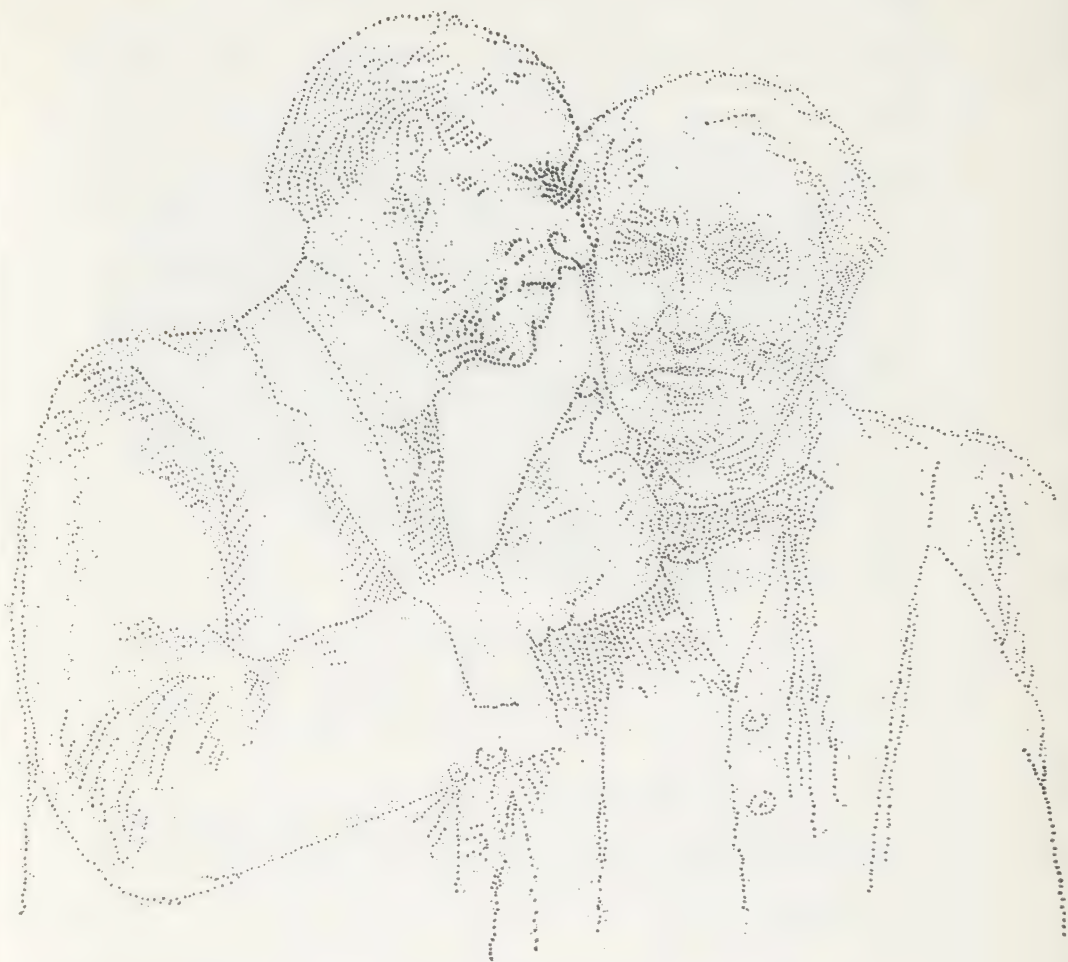


frame and bed-plate on which to make copy by passing ink through the stencil by means of a roller. It was a sturdy piece of equipment made of cast iron.

The word "stencil" has been placed in inverted commas because Edison did not use it in the patents concerned. He referred to the process as Auto-graphic Printing.

In any appreciation of these steps in stencil history it is important to note that the "stencil" for Edison's electric pen process consisted of an ordinary sheet of paper which was neither waxed nor in any way rendered impervious to ink. Edison probably demonstrated the process using dyes which in solution would rapidly penetrate the holes in the paper and not so readily pass through the body of the sheet.

A reproduction of a remarkable copy from an electric pen stencil is illustrated opposite. It is specially interesting in that it depicts Edison as a much older man with his faithful friend Henry Ford, the famous motor magnate. The likenesses are excellent. It was made in 1929 at the Edison Menlo Park Buildings at the Henry Ford Museum, Dearborn, Michigan, using a museum specimen of the electric pen and working from photographs.



Copy from an electric pen stencil made at Edison Institute. Greenfield Village and the Henry Ford Museum, Dearborn, Michigan.

Reproduced with the kind permission of the curator

These Menlo Park Buildings at Dearborn are Edison's original New Jersey laboratories which Henry Ford, as a tribute to his great friend, had caused to be transported and re-erected in the grounds of his famous museum.

The remarkable quality of this needle-point copy recalls to mind the old method by which an artist's original drawing or design, sometimes called the cartoon, was pin-pricked out and then dusted over with a muslin bag containing charcoal or graphite powder to provide the outline copy on which the final work was executed. Edison makes reference to this kind of transfer in his patents and mentions the corresponding process used in

fresco work. Art collectors value highly cartoons made by the masters of the sixteenth century, when it was the recognised method of copying an original drawing, and many will remember the famous discovery of the Holbein cartoon at the Royal College of Surgeons, London, in 1963. With patience a work of art with the electric pen no doubt was possible. But for everyday handwriting the battery-loaded pen was not convenient as a method for daily duplicating.

The pen was top-heavy and difficult to handle. Copies of handwriting obtained by means of the process were "spidery", recognisably dotted, and generally were not good representations of handwriting. As with the papyrographic process it was necessary to use fluid inks or dyes. Nevertheless the electric pen process had some commercial success in America and many outfits were sold in the course of a few years by the Edison Electric Pen and Duplicating Press Company.

The Western Electric Company of Chicago obtained sole rights to manufacture the electric pen and accessories for sale through the agents and offices of the Edison Electric Pen and Duplicating Press Company. This farming-out operation was typical of Edison who was far too busy with other inventions to spend time on the commercial development of this one.

In 1879 the American Institute of Electrical Engineers awarded Thomas Alva Edison of Menlo Park, New Jersey, a medal for the invention and development of the electric pen, more in recognition of an ingenious electrical appliance than of an event of some significance in the history of stencil duplicating.

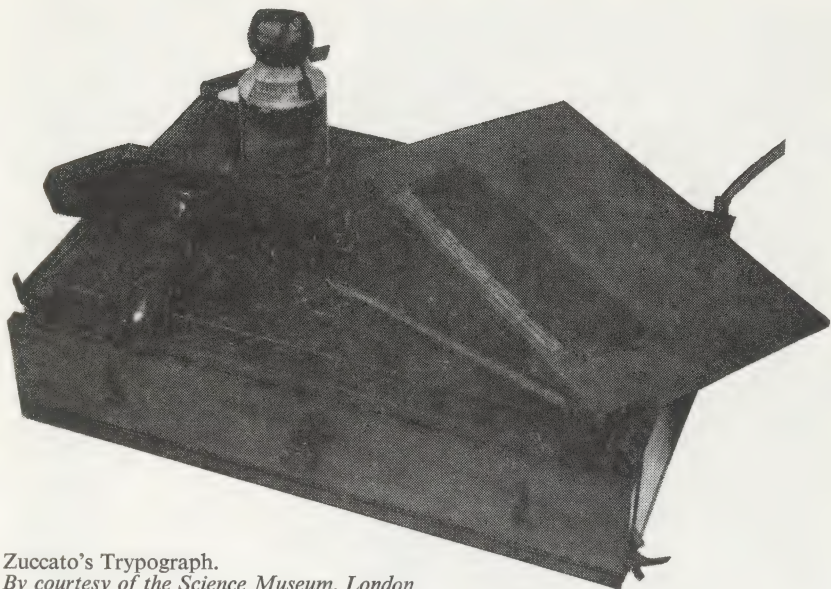
The process does not seem to have been successful in Great Britain or Europe where, by the 1880's, dissatisfied agents were writing back to Edison saying, "they're no good: the short day of the electric pen is over". But in the United States of America it was being used right up to the 1890's, when, like the papyrograph process, its contemporary and early rival, it finally faded out.

The Trypograph

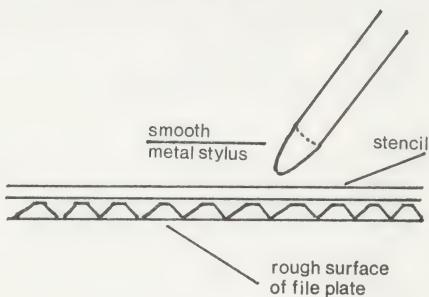
(The File Plate Process)

There was still much need for a more convenient method of boring holes in paper in the form of handwriting to make a stencil. If a sheet of very thin paper, preferably coated with paraffin wax on one side, were placed wax-side up on a rough surface such as that of a file, and written on with a blunt metal stylus, the sharp cutting edges of the grooves of the file punctured both paper and wax to make the ink-passing perforations of a stencil.*

* A file such as a metal worker's file provided such a surface. It was made by cutting grooves in a metal plate like furrows in a ploughed field. File cutting was a skilled craft and such tools were expensive, especially plates of a size suitable for stencil work.



Zuccato's Trypograph.
By courtesy of the Science Museum, London



Right: diagram showing the principle of the file plate process.

MAGIC LANTERNS AND
Evening Parties Attended.
Sole Ruler of the "WALDEN TRIPLEX LANTERN."

FACSIMILE PRINTING,
INSTANTANEOUS REPRODUCTIONS
IN INDOLIBLE BLACK.

* * Many Thousands of copies can be produced from one writing.

ZUCCATO'S PATENT.

TRYPOGRAPH.

No Gelatine nor Transfer. It may be learnt and cheaply in few Reproduction MSS. Made available to Secretaries of Institutions, for issuing Notices to Members, General Circulars, &c.

Prices from 3fs. 6d.
Obtained the Diploma of Honour, Gold Medal at Paris, and Highest Awards at Sydney, Melbourne, and Adelaide.

Specimens, Testimonials, &c., from the Manufacturers,
ZUCCATO & WOLFF,
16 Charterhouse-street, Holborn Viaduct,
LONDON, E.C.

**ROUGH SURFACE
OF FILE PLATE**

An early advertisement for the Trypograph from Knowledge, 4th November 1881

OUTLINES OF
Reference to Localities.
P.L.S., New Edition, 1s.

DOMESTIC BOTANY; an Essay of the Structure and Classification of Plants of Domestic Use, including Horticulture and Manufacture Pursues. By J. C. H. NIELSEN, A.B., &c. In Coloured Plates and Wood Engravings, 10s.

BRITISH FLYCOLOGY.
By the Rev. H. J. DUFFY, M.A., F.R.S., &c.
24 Coloured Plates, 2s.

BRITISH MOSSES.
By the Rev. H. J. DUFFY, M.A., F.R.S., &c.
24 Coloured Plates, 2s.

METEORS, AEROLITES, & FALLING STARS: BY GUY R. HIGGINS, F.R.S., &c.; 25 Woodcuts and 11 Engraving Illustrations, 6s.

MANUAL OF CHEMICAL ANALYSIS QUALITATIVE AND QUANTITATIVE: For the use of Students. By Dr. BENJAMIN S. PEARCE, New Edition. Ocean Sea, 10s. Wood Engravings, 16s. Or separately, Part II., "QUANTITATIVE," New Edition, new Narration, 7s. Part II., "QUANTITATIVE," 10s. 6d.

L. REEVE & CO.,
5, HENRIETTA ST., COVENT GARDEN.

POND'S EXTRA

Is sold by all Chemists at 1/3s., 2/3s., 4/3s., and 8/3s. per Bottle, with some larger sizes, also in 10s. and 20s. Tins. Beware of cheap imitations. None other is genuine.

PREPARED BY
Pond's' Extract Co.
OF LONDON LIMITED,
482, OXFORD ST., LONDON, W.C.



Vol I

The Herald
No 1
February 1885.

Edited and published by
F. W. G. Gilby.

6 Lawn Margaret's Grove London W.

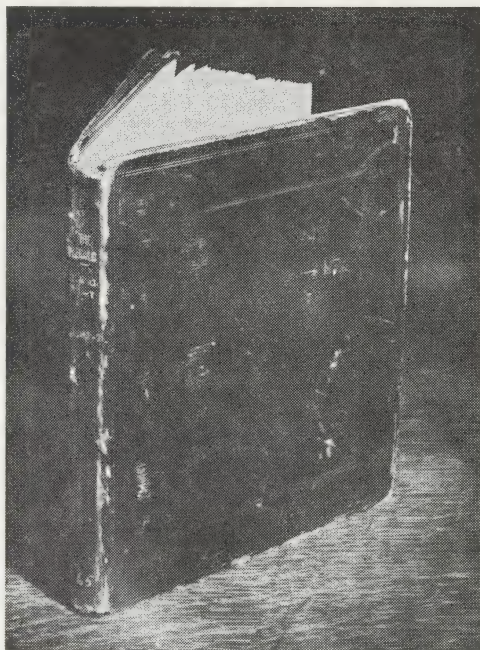
Price one penny.

Zuccato brought forward such a process, applied for a British patent for it in 1877, and called it Trypograph from the Greek word *trypan*, meaning to bore. The amended patent was placed in 1878 and the word Trypograph was registered as a Trade Mark in 1884.

The patent describes the procedure of writing on a stencil in this way and of making copies from it by pushing fluid ink through the perforations by means of a rubber squeegee. The patent also describes and depicts a duplicating apparatus consisting of a stencil-holding frame and a copy-sheet board capable of being raised and lowered. Zuccato also obtained an American patent in 1879 for this apparatus in which only the appara-

Left and Right: A magazine produced entirely by the File Plate process.

By courtesy of The Royal National Institute for the Deaf, Gower Street, London



tus is described—not the method of cutting the stencil, which was subject matter of the British Patent.

Zuccato and Wolff advertised and sold the Trypograph in the 1880's in Great Britain, where it was regarded as an improvement on both the papyrograph and the electric pen. The file was provided in the form of a finely grooved plate, some 2 × 8 inches in size, inserted in a wooden writing board. The method, apart from its trade name of Trypograph, came to be known as the File Plate process.

It was much easier to write with a stylus on a file plate than to manipulate an electric pen. But file plates were expensive, and the relatively small plate employed in the writing board made it necessary to move the stencil progressively over the plate as the writing proceeded: an operation attended by considerable difficulty and inconvenience. Styli were made fine, medium and broad and files correspondingly coarse or fine: but copies obtained were essentially spidery, and the process required the use of fluid ink.

A labour of love

A good example of file plate stencil work is shown opposite. This is a reproduction of the first page of a weekly magazine produced in 1885 entirely by this method. The original bound volume (in possession of Dr Gorman of the Royal National Institute for the Deaf, Gower Street,

London), is an archival treasure and a monument to the labour of love that was required in those days for the production of such a work.

On close examination with the aid of a magnifying glass it is possible to see the pattern of the file plate grooving in the form of the ink dots, which are imprints of the holes in the stencil.

Edison and the File Plate Process

The tryptograph duplicating apparatus, but not the file plate process, was patented in America by Zuccato, as mentioned previously. It is interesting, therefore, to find that Edison obtained a patent in 1880 for a similar method of perforating a sheet of paper by placing it on a bed of needle points, or on a grooved metal plate, and writing on it with a blunt metal stylus. In this patent there is no mention of waxing the paper and there is no description of a duplicating apparatus. So far as Edison was concerned a duplicating apparatus, of course, existed in the form of the duplicating press for his electric pen process.

But Edison did not develop this file plate process commercially during the period that the Electric Pen Company was actively promoting his reciprocating needle. Indeed in 1885 he sold the patent concerned to a person called Unz in Philadelphia, who also did nothing with it until he was approached in 1887 by a commercially interested party. But that is another and later story to be dealt with in due course.

Gestetner and the File Plate Process

It was also in 1880 that David Gestetner was granted a British patent for "Improvements in the Means and Apparatus employed in producing copies of writings and drawings and delineations". The improvements consisted of "a board or plate on one surface of which a series of fine wires were laid side by side to form a writing bed for waxed paper stencils placed on it and written with a blunt metal stylus". This is clearly an alternative surface to the file plate: one of larger area so that it was possible to write on the stencil all in one go without having to move it about bit by bit as was the case with the stencil on the small file plate.

This patent by Gestetner is interesting and important in that it shows how he recognised the importance of making the reproduction of handwriting an easy and attractive process.

But more important to our understanding of the ideas and conceptions that mark the various stages of progress, is the suggestion that the work on this patent may have led Gestetner to the great invention of his stencil-puncturing pen. The wired surface is not likely to have been able to effect a good perforation of the stencil when used with a blunt stylus. Why not a sharp one, needle pointed? Why not a sharp toothed-wheel instead? This is how inventions are made. First the complicated and then the sublimely simple .

The File Plate Process and the Far East

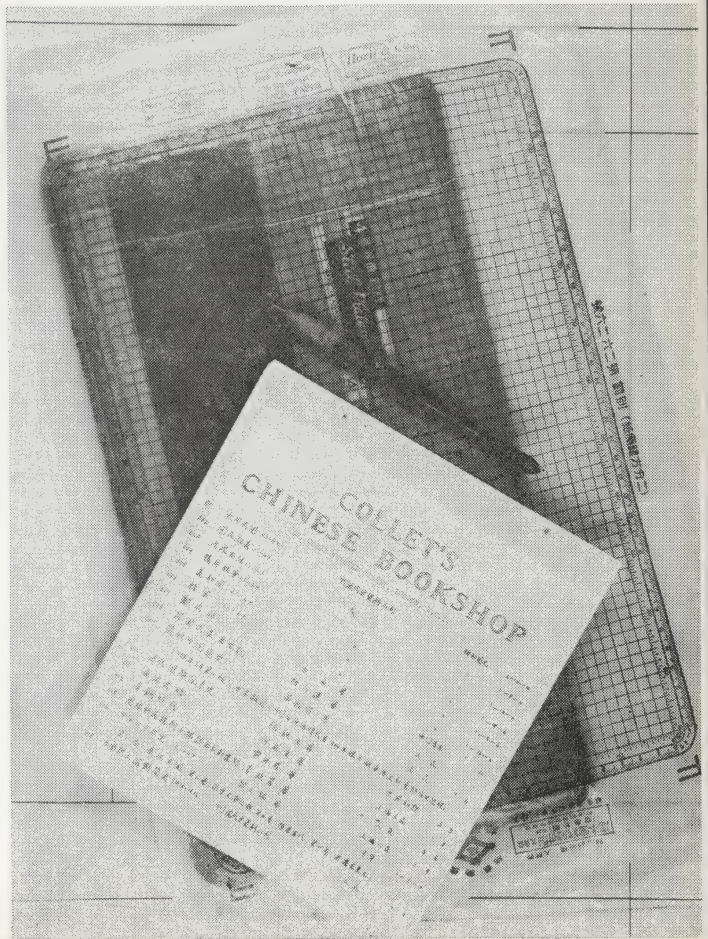
The file plate process eventually reached the Far East where it was found particularly useful for the reproduction of handwritten Chinese and Japanese script. It was brought from the United States of America to Japan about 1894 by Mr Horii, founder of one of the Japanese stencil-making companies of today. A fairly sharp stylus was employed and the intricate lines of the ideograph were cut in the wax stencil with great skill, and the process quickly became popular in Japan and later in China. The Horii Company took out patents in the 1890's for improved wax stencils for the process.

The file plate process is still used to some extent in the business world of the Far East, where it has survived because it is much easier and quicker than stencil-cutting on a Chinese or Japanese typewriter. Such typewriters have to carry as many as three thousand different type-characters, the selection and movement of which is necessarily slow.

The Chinese Bookshop in Great Russell Street, London, opposite the British Museum, still uses book lists prepared by this method. A list is illustrated below, together with the mounted file plate, stylus, and wax stencil with which it was produced. The file plate and stylus are Chinese; the stencil Japanese.

The File Plate process currently used by Chinese commercial concerns.

Illustration by kind permission of Collet's Chinese Bookshop, Great Russell Street, London



So much for the origin of the stencil duplicating process in the Far East—a finding very different from the assumption that such a process, like printing, would be known in ancient China.

The Cyclostyle—A Wheel pen for writing on Stencils

None of the stencil processes so far described permitted an easy passage of ink through the perforations of the stencil, and stencil duplicating consequently was not yet a realistic and reliable office process. The real break-through came in 1881 when David Gestetner appeared on the scene with a patent for his invention of an ingenious writing instrument consisting of a small, toothed wheel mounted on a steel shaft at the end of a wooden holder. Its importance to the development of stencil duplicating lay in its ability to make good ink-passing perforations in a sheet of waxed paper so that excellent reproductions of handwriting could be obtained from the master-stencil formed at the time of writing.

British and United States Patents were granted to David Gestetner in 1881 and 1882 for this instrument, which came to be called the Cyclostyle. The waxed paper or stencil was placed not on a file plate, but on a smooth surface such as a sheet of tinned metal or zinc (a soft metal) and the Cyclostyle was held in the hand like a pen. Indeed it was a pen—a wheel pen—and the teeth of the wheel, cut in the rim, effectively punctured both wax and paper, forming good perforations through which the ink could freely pass. Stencils at that time, as previously mentioned, consisted of sheets of thin paper coated with paraffin wax on one side.

It is interesting to contrast the relative roles of the cutting surfaces in these various processes. In the Cyclostyle method the sharp teeth of the wheel pen move, while the smooth surface of the metal plate on which the stencil is placed “stays put”; whereas in file plate work the sharp cutting edges of the file plate remain stationary, while the relatively smooth blunt point of the stylus “does the moving”. The electric pen had a reciprocating needle action, cushioned by stout blotting paper under the stencil.

WHEEL PEN PATENT.

Nº 2450. 3rd Decr. A.D. 1881.

Perforating Instrument: For Producing Stencils to be Employed
in the Reproduction of Writings, &c.

LETTERS PATENT to David Gesteiner, of South Street, Thurstoe Square, in the County of Middlesex, for an Invention of "IMPROVEMENTS IN PNEUMATIC INSTRUMENTS FOR PROMPTING STENOGRAPHS TO BE EMPLOYED IN THE REPRODUCTION OF WRITINGS, DRAWINGS, AND OTHER DELINEATIONS."

PROVISIONAL SPECIFICATION left by the said Thomas. Gristeater at the Office of the Commissioners of Patents on the 3rd June 1881.

DAVID GREENBERG, of South Street, Thirde Square, in the County of Middlesex. "IMPROVEMENTS IN PERSUADING INSTRUMENTS FOR PRODUCING STENCILS TO BE EMPLOYED IN THE REPRODUCTION OF WATER-COLOURS, AND OTHER DELINEATIONS."

The invention has for its object improvements in perforating instruments for producing stencils to be employed in the reproduction of writings, drawings, and other delineations.

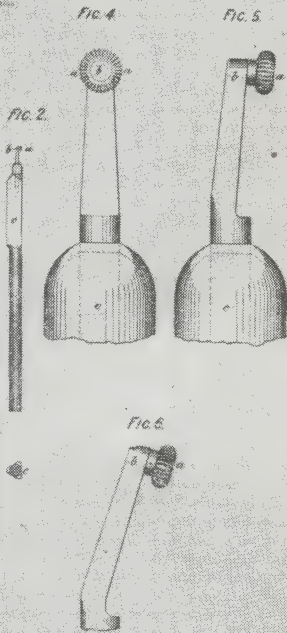
10 For this purpose I employ a toothed, notched, or roughened wheel of small diameter, and I mount this wheel upon an axis carried by a holder or handle similar to a pencil or pen.

I in some cases incline the axis of the perforating wheel, in order that the instrument when in use may be held by the hand in an inclined position in a similar manner to an ordinary pen, and yet allow of the perforating wheel remaining upright, but I do not confine myself to the arrangement.

By the aid of this instrument lines of minute perforations are produced by writing or drawing thereon upon thin waxed paper or other suitable material placed upon any even surface, but I have found that by employing a surface of 20 tinned metal for this purpose I obtain good results. This sheet of perforated paper or other material forms the stencil, and may be employed to reproduce the writing, drawing, or other delineation in any desired manner.

[Price Est.]

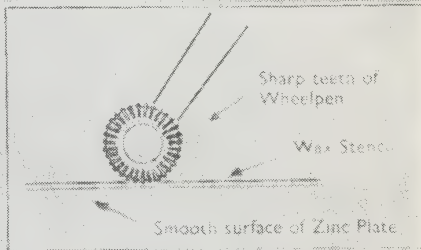
A.D. 1881. June 3. N° 2450.
GEBLETNER'S SEEDLING.
2nd Edition.



This drawing is a reproduction of the original out in relief work.

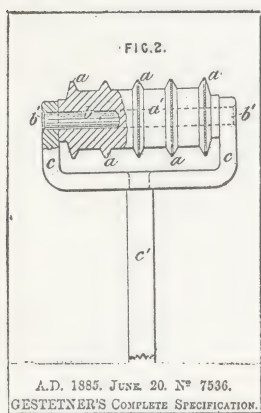
Printed by George and Son, Ltd.,
The Manchester Press, Ltd., Manchester.

Hobby & Game Area - 2000

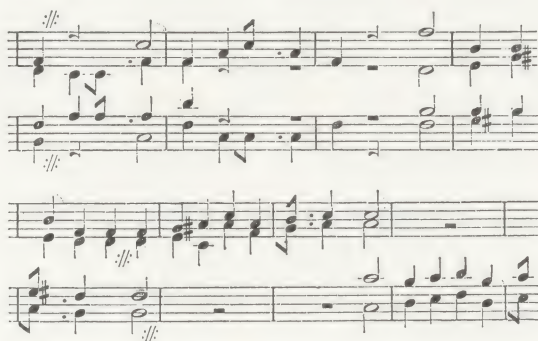


Also for music

In a further patent some years later Gestetner extended the wheel-pen idea to a music pen consisting of five toothed wheels on a single boss by means of which the staff of five horizontal lines for musical notation could be made with a stencil cheaply on ordinary paper. This alternative to expensive printing of the blank music paper or of laboriously ruling each sheet by hand, was greatly appreciated and reference to the reproduction of music is made in early advertisements for the Cyclostyle process.



Gestetner's specification for a wheel pen specially designed for reproducing music staves.



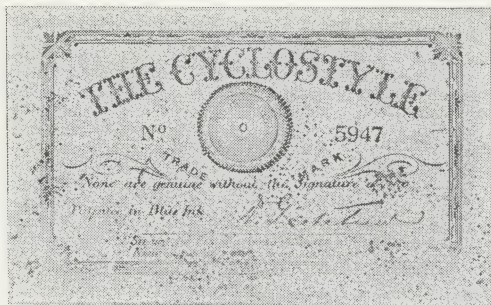
The Cyclostyle Duplicating Apparatus

The Cyclostyle duplicating apparatus consisted of a block of wood to which a sheet of tinned iron or a sheet of zinc was pinned to act firstly as writing plate and then as duplicating bed. The stencil was placed on a frame hinged to the side of the bed. Bigger in size than the frame, the stencil was stretched and held in place by means of a second removable frame clamping into grooves in the hinged frame. The frame with stencil in place was closed down over the block and the stencil was then written on with the Cyclostyle. The frame, complete with written stencil, was thereafter raised, a sheet of copy paper placed on the bed, the frame lowered again, and ink applied by a hand-roller to the outside of the stencil.

In contrast to modern duplicating on rotary stencil duplicators—involving rotating cylinders—this early form of apparatus is referred to as a flat-bed.

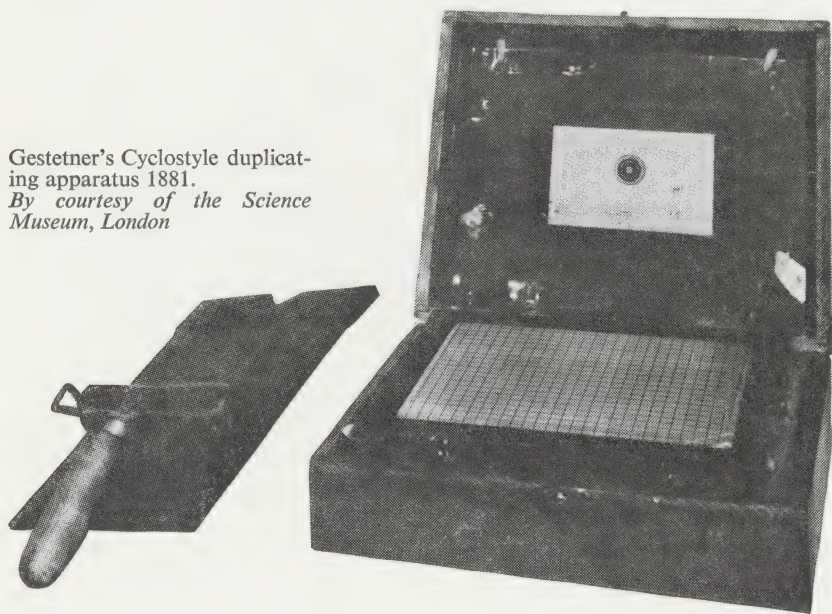


David Gestetner as a young man.



An enlargement of the label on the box illustrated below

Gestetner's Cyclostyle duplicating apparatus 1881.
By courtesy of the Science Museum, London



At the time it was known, of course, without further qualification, as the Cyclostyle duplicating apparatus.

There is a fine example of this original Cyclostyle duplicating apparatus in the Science Museum, London. No 5947 on the label indicates that these duplicating boxes were selling well. Also on the label is the inventor's signature "without which none is genuine" and the trade mark (the wheel) about which we have more to say in a later section.

Gestetner's patent for Japanese paper

The excellent and easy copy that was eventually obtained by stencil duplicating with a wheel pen did not come all at once and depended on two other important inventions which Gestetner patented. The first of these was for an altogether new base tissue for stencil making, patented in the United States of America in 1885, and consisting of "a sheet of Japanese paper to which a layer of paraffin wax was applied".

This Japanese paper was made from Bamboo fibre or from a Japanese fibre called Gampi and was known commercially, from its port of origin, as Takamatsu. Its special characteristics as a stencil base were the long, fine but strong fibres forming a sheet of relatively open texture. It was thus that the teeth of the wheel pen after piercing the wax could easily perforate this special tissue without breaking any of the fibres. This was made possible by the essentially porous nature of the tissue into which the teeth easily penetrated, pushing or expressing the wax aside.

The success of the stencil process depended on David Gestetner's recognition of these special qualities of Japanese paper; and the stencil manufactured by him using Takamatsu became the prototype of the modern stencil. Before waxing it was printed with lines to form squares as guides to writing and lettering. This squared Cyclostyle Stencil dominated the stencil scene right up to the 1930's, when it was still in use for the duplicating of handwriting. We must recognise that however swift and exciting these inventive days may seem in retrospect, in daily practice handwriting yielded only slowly to typewriting. The male copy clerk retreated slowly before the advance of the female typist.

Note has been made previously of Japanese papers in connection with the later development stages of the letter copying book process—when it was mentioned that they were imported for the first time into this country in 1868 as a result of permission granted to Western traders to enter Japan. One of those Western traders was Berrick and Company, Tokyo, who began shipping Japanese papers to their opposite number in London, Berrick Brothers of Kirby Street, EC. It was from this source that David Gestetner obtained his supplies of a particular Japanese paper, paying cash on delivery until such time as his prosperity and fame entitled him to larger credit.

That was in 1885. But David Gestetner had knowledge of Japanese paper some ten years earlier when he was forced by ill-luck to sell Japanese paper kites for a living on a street corner in Chicago. This interesting story is developed in greater detail on page 80 in a brief biography of this inventive man and tells how the Japanese base paper of the kite became the base paper of a handwriting stencil. One of the kite pictures that frequently appeared in Gestetner literature in the early days of the company is reproduced on page 59 by way of recognising the importance of this event in the history of the origin and development of stencil duplicating.

UNITED STATES PATENT OFFICE

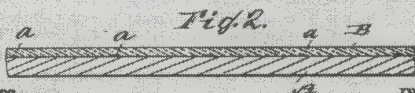
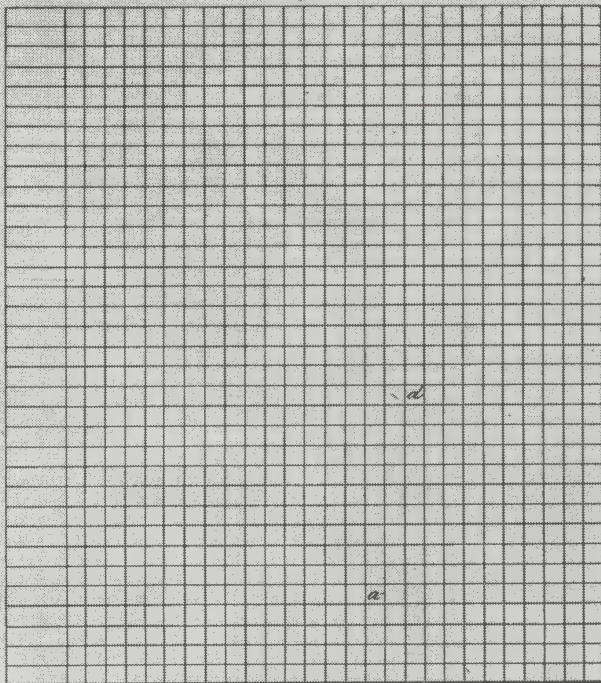
(No Model.)

D. GESTETNER.

TRANSFER OR REPRODUCING PAPER.

No. 332,890.

Patented Dec. 22, 1885.

Fig. 1.

WITNESSES:

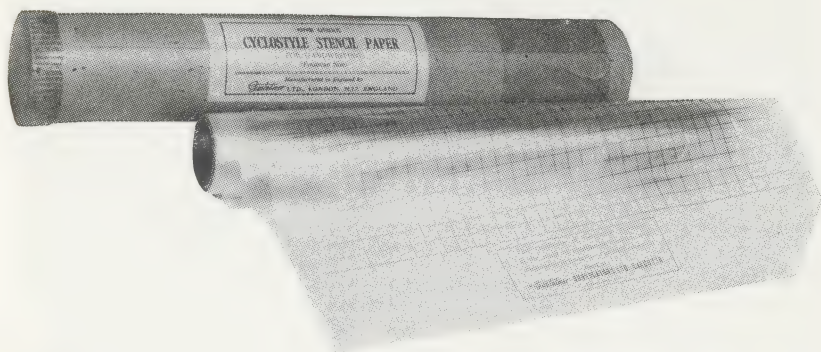
Wm. G. Washburn
& Co. Agents

INVENTOR:

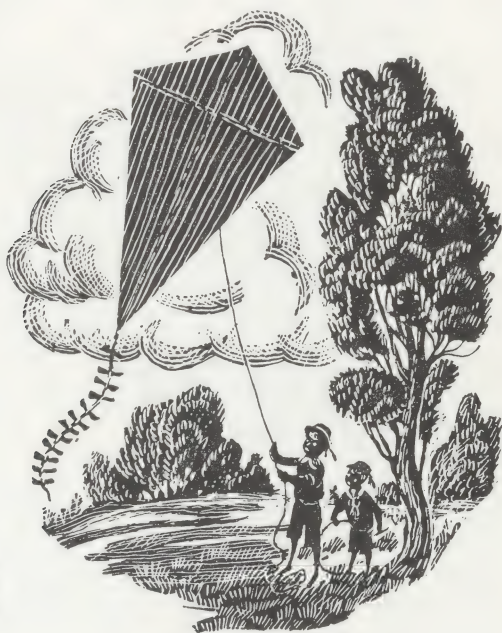
D. Gestetner

BY

Munn & Co.
 ATTORNEYS



Gestetner's patent for Japanese stencil paper (*left*) and wax stencil made from it (note the stencil is called Cyclostyle Stencil Paper). Production of this stencil continued until as late as 1950.



One of the kite pictures that frequently appeared in Gestetner literature in the early days of the company.



Pens through the ages. 1 Babylonian wedge, 2 Egyptian reed pen, 3 Roman stylus, 4 Monastic quill, 5 Steel nib (19th century), 6 Fountain pen, 7 Wheel pen, 8 Ball pen (1945).



Japanese tissue, hand-made and dried in the sun.

From A Papermaking Pilgrimage to Japan by Dard Hunter; Pynson Printers, New York



Romantic also was the making of Japanese papers from the bark of the mulberry tree—a family back-garden industry at that time. Dard Hunter, in his *Papermaking Pilgrimage to Japan*, one of his monumental works on the paper industry of the Far East, describes and illustrates the age-old methods of making paper one sheet at a time by hand. With permission we publish a couple of pictures from this work.

The Neo-Cyclostyle

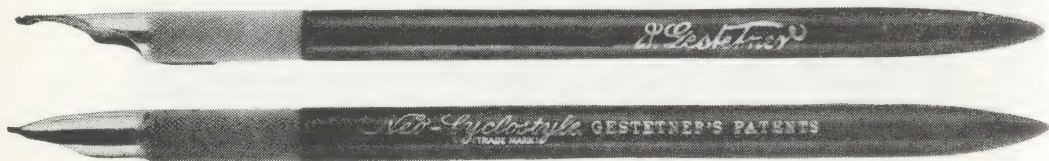
The improved wheel pen

David Gestetner's third great contribution to the success of stencil duplicating was his recognition of the importance of making handwriting on stencils simple, coupled with his invention of an improvement of the Cyclostyle wheel pen to make this possible. The original Cyclostyle wheel pen had the axis of the wheel set at right angles to the stem of the stylus. The new Cyclostyle had the tip of the stylus bent so that the wheel could be set at a much more convenient angle. No longer was it necessary to hold the Cyclostyle vertically while writing. It could now be held in the hand at a comfortable angle just like an ordinary pen.

He obtained a British patent for this improvement in 1888 and called the product the Neo-Cyclostyle. It was an instant success and at once began to play its part in making the handwriting stencil process popular. The illustration opposite is a reproduction of a relevant page from the patent in which the essence of the improvement can be read in the inventor's own words.

The corresponding American patent was taken out by David Gestetner in 1888. By agreements entered into, this pen, when sold in the States by Gestetner's American agent, was known as the Neostyle.

The Neo-Cyclostyle looked like a pen, and the tip carrying the little wheel at the correct angle was shaped and fashioned like a pen nib.* It was



Above: The Neo-Cyclostyle.

Opposite: Gestetner's Neo-Cyclostyle patent.

* Steel nibs to rival the quill had been introduced by Joseph Gillott in 1830, had steadily increased in popularity, and were well established in the commercial office at the time of the Neo-Cyclostyle. See also footnote page 34.

Date of Application, 16th Aug., 1888.
Specification Accepted, 28th Sept., 1888.

A.D. 1888, 16th Decem. N° 11,832.

COMPLETE SPECIFICATION.

Improvements in "Cyclostyle" Pens for Producing Stencils to be Employed in the Reproduction of Writings, Drawings, and other Delineations.

I, DAVID GESTETNER of 70 and 71 Chiswell Street in the City of London, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

- 5 The invention has for its object improvements upon an invention for which I obtained Letters Patent dated June 3, 1881, No. 2450.
- Herebefore the perforating wheels of "cyclostyle" pens have been mounted on an axis projecting from the side of the stem or holder, by which construction it was requisite that the pen, when in use, should be held in such manner that the perforating wheel should be to the right of the stem or holder and with its periphery moving in planes running more or less nearly from top to bottom of the paper. When such a pen is otherwise held the writing is liable to be faulty and the stencil paper to be torn, in addition to which, the use of such pen is somewhat restricted, as few but accustomed hands can use it successfully.
- 10 Now I have discovered that if the "cyclostyle" wheel is mounted on the stem or holder in such a position that the periphery thereof shall, when the pen is in use, move in planes running more or less nearly in line with the lines of writing, and more or less nearly vertically of the paper, much greater freedom is obtained in the use of the "cyclostyle" pen, and better results are consequently obtained.
- 20 In the accompanying drawings I have illustrated two forms in which I carry my present invention into effect.
- The form I prefer to employ is represented at Figures 1 and 2, which are two views of a "cyclostyle" pen, drawn to the natural size, and Figure 3, which is a view of part thereof drawn to an enlarged scale.
- 25 Figure 4 is a view of a modified form of "cyclostyle" pen drawn to the natural size and Figure 5 is a view of part thereof drawn to an enlarged scale.
- In all the Figures like parts are indicated by similar letters of reference, a represents the "cyclostyle" wheel and b the stem or holder.

[Price 6d.]



A.D. 1888, 16th Decem. N° 11,832.

SPECIFICATION

OF

DAVID GESTETNER.

IMPROVEMENTS IN "CYCLOSTYLE"
PENS FOR PRODUCING STENCILS TO BE
EMPLOYED IN THE REPRODUCTION OF
WRITINGS, DRAWINGS, AND OTHER
DELINEATIONS.

LONDON:

PUBLISHED AND SOLD AT THE PATENT OFFICE SALE BRANCH,
25, CURNITON STREET, CHANCERY LANE E.C.

Price 6d.

1888.



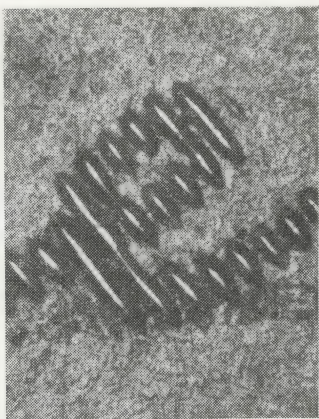
the fact that the wheel pen was in every sense a pen for writing in a hand-writing age, that greatly enhanced the Cyclostyle process. For it meant that in the ordinary course of writing with a pen a master was produced—a master from which a large number of copies could be made.

Under the microscope

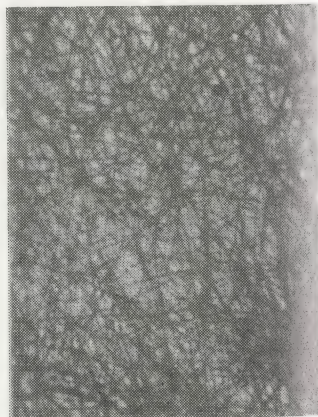
The microscope reveals the reason for the excellent ink-passing perforations and corresponding copies obtainable by means of the Neo-Cyclostyle wheel pen. The illustration below illustrates the facts in three shots showing the pen, the perforation, and—the Japanese paper.



The Wheel pen $\times 7$.



Enlargement of the letter in stencil $\times 25$.

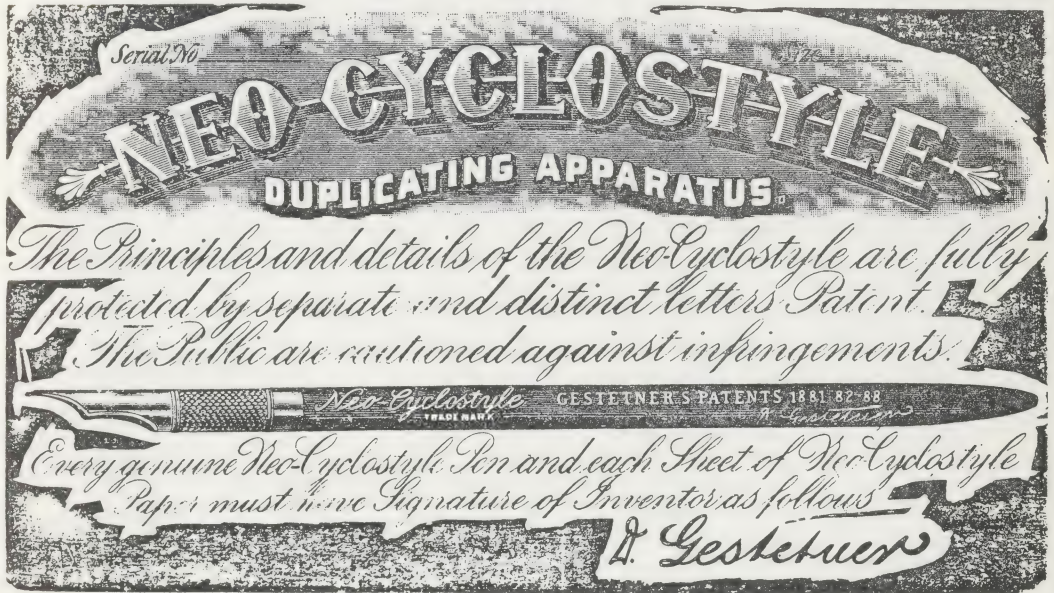


The Japanese base paper $\times 50$.

Cyclostyling

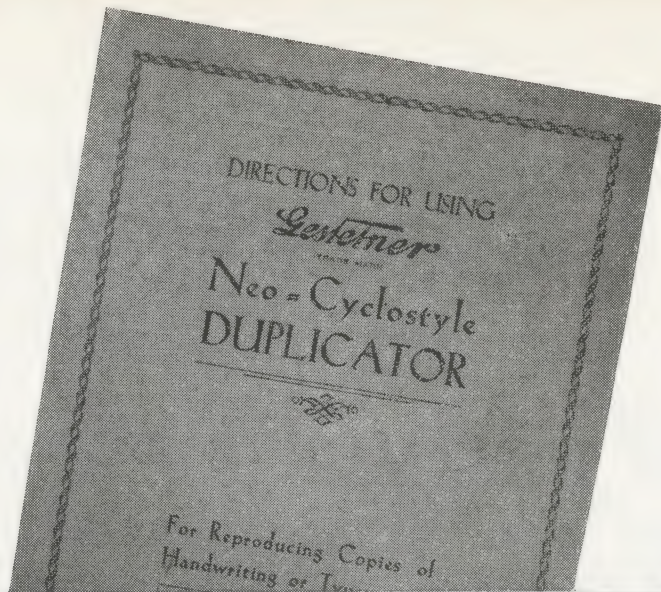
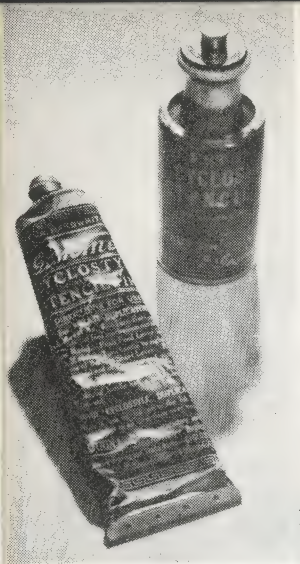
The new pen soon became associated with a new duplicating apparatus called the Neo-Cyclostyle duplicating apparatus, a very elegant piece of office equipment, beautifully boxed in oak with brass hinges.

It was this apparatus, in conjunction with the Neo-Cyclostyle pen and the special stencil on Japanese paper, that in the late 1880's and early 1890's established the stencil duplicating of handwriting as a successful process and ensured its adoption as an office procedure. It stood the test of time and was standard office practice far into the twentieth century. Indeed flat-bed duplicating appliances based on the principle of the original Gestetner Neo-Cyclostyle apparatus are still used in many parts of the world today.



Right: The Neo-Cyclostyle duplicating apparatus, the label on the lid is enlarged above.





DIRECTIONS FOR REPRODUCING HANDWRITING

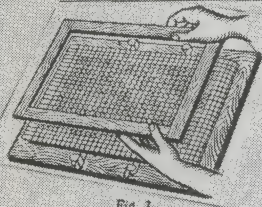


Fig. 1

Release the clips on Printing Frame and remove the top portion. Lay sheet of prepared stencil paper (writing side uppermost) on the metal bed as shown in Fig. 1. Replace top frame and secure by fastening clips on the four sides. Take care that the paper lies evenly and without creases.

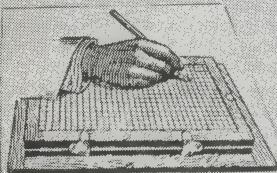


Fig. 2

Write on the Stencil paper with the Neo-Cyclostyle Pen, holding this in the same way as an ordinary pen. Write with a firm even pressure ON BOTH UP AND DOWN STROKES. [Fig. 2.]

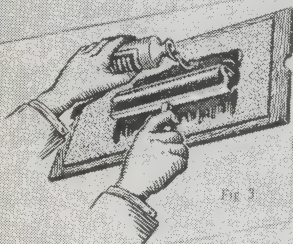


Fig. 3

Pour a few drops of Neo-Cyclostyle Ink (or squeeze some from the tube) on to the inking board. Pass the roller firmly in all directions over the ink so as to get an even distribution

on the whole of the roller. [Fig. 3.]

Raise the Frame, place a sheet of paper on the metal plate and close the Frame. [Fig. 4.]

Pass roller with a firm pressure once only and in ONE DIRECTION over writing. The first two or three copies should be taken on waste or blotting paper, until the ink has properly worked through. Note.—If unable to obtain a good copy with one firm roll, place more ink on the inking board and distribute as before [Fig. 5.]

Raise the Frame remove printed copy, replace with fresh paper and repeat until the desired number of copies are obtained. [Fig. 6.]

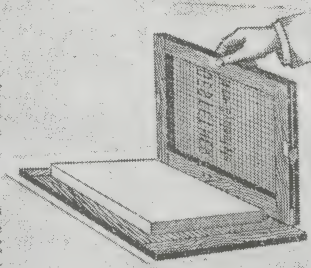


Fig. 4

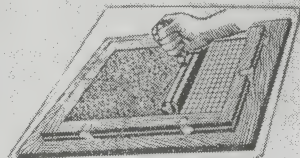


Fig. 5

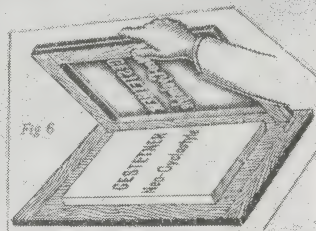


Fig. 6

Top Left: Cyclostyle inks.

The Neo-Cyclostyle at work, from a contemporary manual.

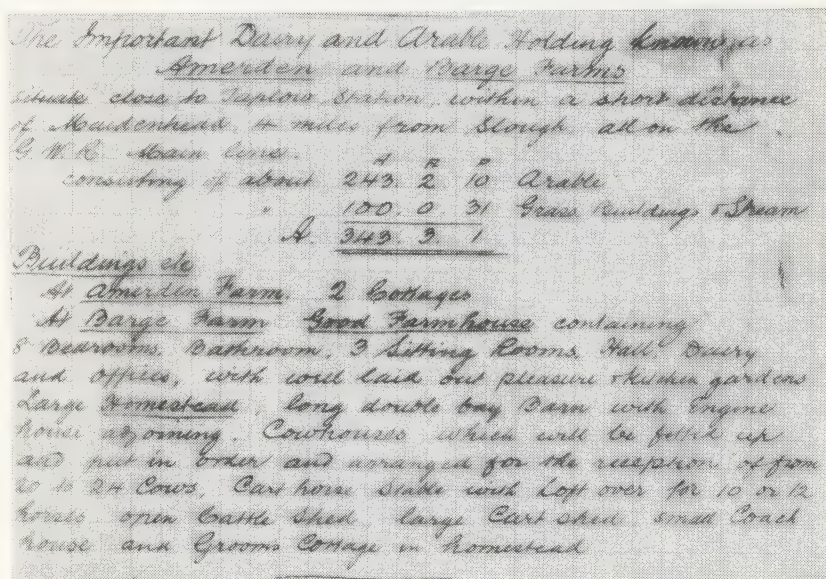
In the 1880's the process was called cyclostyling, a word that was used for stencil duplicating in Great Britain right up to the 1930's. The word comes from *Kyklos* meaning circle and *stilus* for style or rod for writing. According to the *Oxford English Dictionary*, first reference to the word in general literature occurs in the *Chicago Advance* of 9th May 1887, where it is reported that some young lady "printed it herself by Cyclostyle". In Gestetner literature the Cyclostyle is known as "the little wheel that started a great revolution".

With the skill acquired by experience it was possible to roll off a good copy in under ten seconds. A far cry from today's 150 copies a minute: but in the 1880's it was office duplicating for the first time in quantity, at speed, and of good quality—a full flowing reproduction of handwriting acceptable to office clerks skilled in the calligraphic arts.

Early advertisements for the process claimed 2,000 copies from one stencil and included such innuendo as "no dyes, no jellies, no mess". Knocking the competition was fair enough even in those days.

The art and craft of cyclostyling is described and illustrated by W. Desborough in *A Manual of Duplicating Methods* published by Sir Isaac Pitman in 1917, the earliest publication in book form on the subject of duplicating. The author, chief officer of His Majesty's Stationery Office, speaks of the rich burring sound to be heard when the wheelpen is executing its calligraphic masterpieces in the hands of an experienced operator.

The illustration opposite shows the Neo-Cyclostyle duplicating apparatus



Photograph of a portion of a wax stencil cut by means of Neo-Cyclostyle.

at work and demonstrates the main steps of the operation, and page 67 shows a hand-writing stencil produced in an estate agent's office in 1917, the earliest example in the archives.

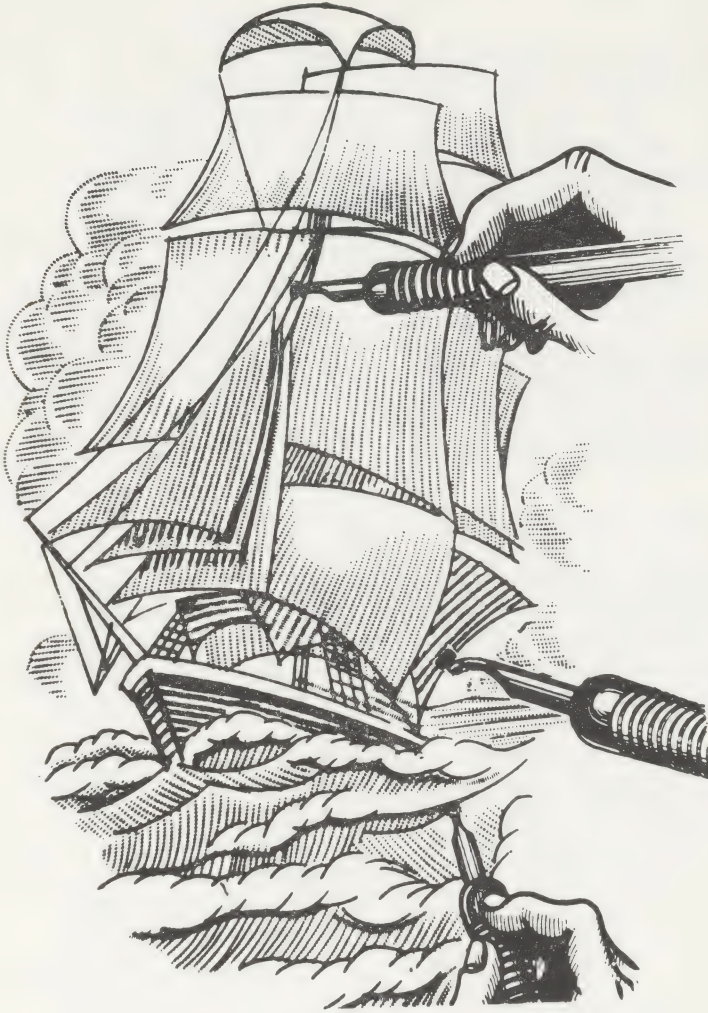
Fluid inks sold in stone bottles were used at first, but the process was soon able to advance to the use of inks of a paste-like or buttery consistency much to the advantage and convenience of the operator. Such inks were a great improvement on the messy violet inks of hectograph and the runny fluids of the file plate process.

Pens for all purposes

The wheel pen was subsequently issued in several different styles to provide pens for fine lines, medium, and broad, and a corresponding range of pens was made with the wheel mounted at a still more oblique angle to suit the hand that preferred an oblique nib for ordinary penmanship. The original Cyclostyle wheel pen with its wheel set straight at right angles to the stem was retained for ruling.



Pens for all purposes.



Artistic effects unique to the medium.

Much later, both writing and ruling wheel pens were made additionally in a series in which the pitch and shape of the teeth were varied to give such interesting and useful effects as dotted lines, broken lines, dot-dash and other patterns. They were called shading pens and were much used for drawing on stencils, especially fashion drawing and illustrating, and ornamentation for direct mail advertising. The artistic skill with which these pens could be used in work of this kind has always commanded admiration. Some of the effects were unique to this new medium.

MADAME
la Couturière

DRESSMAKIER
TO LADIES
OF
QUALITY



Early days of the Cyclostyle business

When David Gestetner took out his patent for the wheelpen in 1881 he was engaged as a stationers' assistant in the employment of Fairholme and Company in Shoe Lane, Holborn, London, who were associated with the Honourable William Frederick Barton Massey-Mainwaring, son of an Irish peer. In an arrangement between employer and employee the young Gestetner agreed to "make over his invention" to Fairholme and Company, who defrayed the expenses of taking out the patent. It seems they went a great deal further and started the young man up in the venture of manufacturing the pen and equipment for the new duplicating process. In return for this the young inventor arranged to sell the goods to Fairholme and Company for resale in Great Britain through their stationers business.

An agreement to this effect was entered into on 26th September 1881, in which the pen was referred to as the Cyclostyle, a name suggested by Walter Binns, Manager of Fairholme and Company. The agreement included a clause giving Gestetner the right, in certain circumstances, to have the Letters Patent for his pen restored to him.

Manufacture of the pen, stencils, and ink was commenced in 1881 and carried out by Gestetner in a room in Sun Street, Finsbury Circus, not so far from Shoe Lane. In this first Cyclostyle workshop Gestetner employed one girl making the stencils and inks. In the finer craft of making the tiny toothed wheels Gestetner had the good fortune to obtain the help of Frederick Moore, a watchmaker in Clerkenwell, whose grandson until quite recently was in charge of the Pen Shop at Gestetner's factory in Tottenham.

This was the small beginning of the House of Gestetner—an association of the young inventor and manufacturer with his employers, the retail stationers. There is some evidence that, to begin with, Fairholme and Company assisted in the production of the Cyclostyle duplicating apparatus, which David Gestetner eventually took over as he gradually became more and more independent.

Advertisements and trade marks

A year after the start of the business in Sun Street an illustration of the wheel of the Cyclostyle was entered in the *Trade Marks Journal* of 1882 under the name of Fairholme and Company, described as manufacturers. The endearing inscription on this symbol of the famous pen, *vires aquirunt eundo* translated could read, "he prospers by getting on with the job". The appearance of this trade mark in Fairholme's name was part of the arrangements concerned with organising the start of the selling side of the cyclostyle business—part of the process of getting on with the job.

Left: Cyclostyle in fashion.

In that year of 1882 David Gestetner patented the wheel pen in the United States of America.

The earliest known advertisement for the Cyclostyle appeared in the magazine *Knowledge*, the *New Scientist* of its day: in the 12th January issue, 1883, in the name of Fairholme and Company of Great Winchester Street, London, E.C., Gestetner's patent was referred to in the advertisement by its official number.

In 1884 three entries appeared in the *Trade Marks Journal*, all on the same day, and all declared as "Stationery and Apparatus". One was for the word "Cyclostyle" entered by Fairholme and Company; the other two under David Gestetner's own name at his home (lodgings) address in Thurloe Square, where he is described as manufacturer. One of the Gestetner entries was for the facsimile signature, "D. Gestetner", which appeared on each and every pen and stencil, on every bottle or tube of ink, and on every duplicating apparatus made by the inventor. The other was for "The Gestetner", a form of the name and mark, however, that was not much used as the business developed.

Gestetner in his embryo Cyclostyle business was making and selling to Fairholme and Company goods, stamped with his own, and subsequently famous signature, and Fairholme was retailing them as the Cyclostyle products. A success story; for in that same year of 1884, the business growing, Gestetner moved from Sun Street to new and larger premises nearby in Chequers Alley, off Bunhill Row, in the City of London.

Advertisement for the Cyclostyle in *Knowledge*, 12th January 1883.

WORKS
E.C.
SON,
OPTICIANS.
Microscopes, Objectives,
for six stamps.
Hand Objectives of good
and continental makers, to
or separate.
SPECIALS ON APPLICATION.
ENHAM COURT RD., LONDON, W.
T. MAYFIELD,
41, QUEEN VICTORIA STREET,
JIT DEPOT FOR EVERY REQUIREMENT IN ELECTRIC
EXPERIMENTS.
COPPER WIRES,
All sizes, coated with Cotton, Silk, or Gutta-Percha.
BRASS TERMINALS AND CLAMPS,
For all purposes.
BATTERIES of every kind complete or in parts.
Induction Coils, Incandescent Lamps,
EXPERIMENTAL WORK UNDERTAKEN.

ISH TO KEEP WELL, TAKE
eggs Sold by all Chemists
Vegetable
in Bottles 2/4 & 6 each
Charcoal
PURE VEGETABLE CHARCOAL BISCUITS.
Possessing all the properties of the Charcoal in an agreeable form for children or adults. In Tin Cases, 2s., 4s., and 6s. each. J. L. BRAGG, 14, Wigmore-st., London, W.; and of all Chemists throughout the world.

THE CYCLOSTYLE.

Patent No. 2450, of 1881.

An entirely new and original apparatus for obtaining from one original hundreds of facsimiles in permanent black, or any other coloured ink, of writings, drawings, plans, music, &c. Very easy to manipulate. Requires no special knowledge. Prices: Octavo size, 21s.; Quarto, 27s. 6d.; and Foolscap, 31s. 6d.; Brief or Folio, 45s. Complete, with ink and one quire of paper. Ask for specimens.

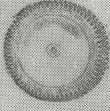
FAIRHOLME & CO.

9, GREAT WINCHESTER STREET, LONDON, E.C.

TO ADORN THE WALLS OF HOME
with Artistic Masterpieces at small cost, visit the Autotype Fine-Art Gallery, 74, New Oxford-street, W.C.

The Autotype Company display a Noble Collection of Copies of ANCIENT AND MODERN MASTERS, selected from the principal Art Galleries of Europe. Examples of the Works of Fra Angelico, Bartolommeo, Correggio, Dürer, Holbein, Michael Angelo, Raphael, Rubens, Del Sarto, Titian, Da Vinci, &c. Amongst the Moderns will be found examples of the Works of Poynter, Watts, De Neuville, Meissonnier, Corot, Rossetti, Burne Jones, &c. Fine copies of Pictures from the Luxembourg and the "Salon".
AUTO TYPE IN RELATION TO HOUSEHOLD ART (three illustrations), gratis, and free per post, on application to the Manager, Autotype Company, 72, New Oxford-street, London, W.C.

| | | | | | |
|---------------------|---|----|---|--------|----------------|
| CYCLOSTYLE | WILLIAM FREDERICK BARTON MADEY MAINWARING, trading as FAIRHOLME & CO., 95, St. Mark Lane, London. Manufacturers. | 30 | Stationery and Apparatus for pro- ducing Economic Copies of Writings and Designs. | 37,760 | 27th May 1884. |
| THE GESTETNER | DAVID GESTETNER, 25, South Street, Finsbury Square, Middlesex. Manufacturers. | 30 | Stationery and Apparatus for pro- ducing Two-stroke Copies of Writings and Designs. | 37,761 | 27th May 1884. |
| <i>D. Gestetner</i> | DAVID GESTETNER, 25, South Street, Finsbury Square, Middlesex. Manufacturers. | 30 | Stationery and Apparatus for pro- ducing Two-stroke Copies of Writings and Designs. | 37,762 | 27th May 1884. |

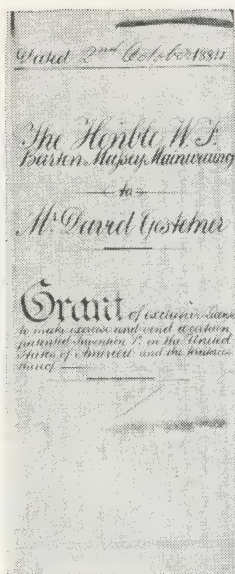
| | | | | | | |
|---|--|----|--------------------------|--------|-----------------|--------------|
|  CYCLOSTYLE | WILLIAM FREDERICK BARTON MADEY MAINWARING, trading as FAIRHOLME & CO., 9, Great Winchester Street, London. Manufacturers. | 30 | Stationery and Printing. | 37,760 | 25th Feb. 1882. | Not so used. |
|---|--|----|--------------------------|--------|-----------------|--------------|

Trade Marks Journal 1882-84.

Agreements and indentures

As yet, Gestetner had not effected his agreement to make over his British patent on the wheelpen to Fairholme and Company; but on 1st October 1884 he entered into an agreement assigning his American patent to them. And on the 2nd October 1884, in a further indenture, Fairholme and Company gave Gestetner an exclusive licence to sell the product in the United States of America. The agreement mentions a royalty of 2s 6d per pen payable to Fairholme and Company. Interesting to find the inventor paying a royalty on his own invention! But that is how it worked out in the early days of starting the business.

In 1884, an eventful year in the annals of the young Cyclostyle business, Gestetner entered into an arrangement with Augustus David Klaber,



An exclusive licence to the inventor.

"The certain patented invention" being Gestetner's Cyclostyle, the American patent for which David Gestetner had, in an earlier indenture, assigned to the above Hon W. F. Barton Massey-Mainwaring of Fairholme & Company.

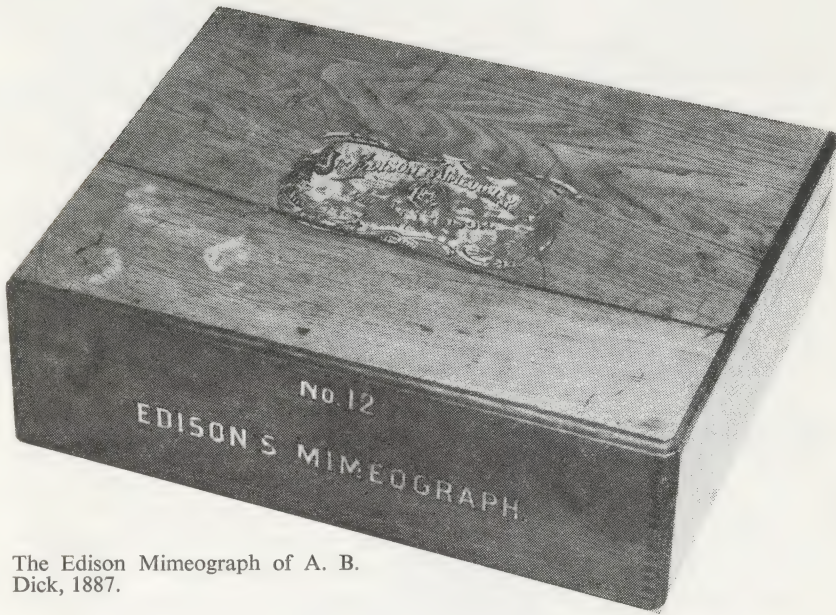
appointing him sole agent to go to New York and start a business for the sale of the Cyclostyle process, pen, apparatus and supplies, in the United States of America. A written agreement dated 1884 to this effect was made out between Gestetner and Klaber clearly declaring the technical, commercial, and financial conditions under which Klaber would act as Gestetner's agent. It was this agreement that started the Cyclostyle business in America, installing Klaber in an office and sales-room in New York. Klaber had been a fellow stationers' assistant employed by Partridge and Cooper in Chancery Lane, London.

A year after getting the New York business underway Klaber, in 1885, by agreement with Gestetner, his employer, took out a patent for a flat-bed duplicating apparatus differing in detail but not in principle from Gestetner's Cyclostyle duplicating apparatus in London. It was an apparatus based on this patent that came to be made and sold by Klaber in the United States of America for use with the Cyclostyle pen and Cyclostyle supplies.

It was also in 1885 that Gestetner obtained the United States patent for the Japanese base-tissue for the Cyclostyle stencil as already mentioned in the earlier and more technical part of the story. 1885 was also notable for the fact that David Gestetner was joined in business by his younger brother, Jacob.

The business relationship between the young manufacturer in Chequers Alley and his former employers became subject of a further agreement, dated 5th April 1886, in which Gestetner's British Patent of 1881 was finally assigned to Fairholme. Close on the heels of this indenture of assignment came a further business agreement in which Gestetner undertook to manufacture and supply exclusively for Fairholme, with the exception of Hungary (Gestetner's country of birth) and U.S.A., about which agreements already existed.

On the manufacturing side, in 1887, Gestetner and his brother moved to still larger premises in nearby Chiswell Street, where they installed a small printing machine to print guide lines in the form of squares on the Japanese base-tissue before coating it with wax to make the stencil.



The Edison Mimeograph of A. B. Dick, 1887.

Mimeograph

It was also in 1887 that the name of the A. B. Dick Company appeared on the stencil scene in America. The A. B. Dick Company is the well-known present-day office equipment business of Chicago. At that time it was a lumber business incorporated in 1884, when the name was changed from A. B. Dick and Company to the A. B. Dick Company, Wholesale Dealers in Hardwood. Albert Blake Dick evidently became interested in the idea of introducing labour-saving methods in his own office, and particularly introducing some form of stencil duplicating. A man of initiative and drive, he soon became enthusiastic enough to form a separate department for the promotion and sale of labour-saving office devices. In association with a friend from the railroad he began making and selling the file plate stencil process complete with a duplicating apparatus. He made patent application for both and the patent office of the United States of America granted him a patent in 1887 for the duplicating apparatus. On the process itself he was referred to Thomas Alva Edison, owner of the United States patent covering the file plate method of cutting stencils.

Rights to use the process itself were required, so Dick promptly sought a licence from Edison—sending his colleague Bingham to Menlo Park. Edison first of all had to find the man Unz to whom in 1885 he had sold some form of rights in the patent as mentioned earlier in this history—rights which he had not used in any way. Edison's secretary, A. O. Tate, author of *Edison—The Open Door*, tells a dramatic story of how the missing Unz was tracked down in Philadelphia and induced to sell back to Edison the said rights in the file plate process for \$600. Thrown in by way of exchange Edison gave Unz the rights in another patent—for a type-writer with typefaces in the form of needle points for cutting stencils! This was yet another patent that Unz never used. Edison was thus enabled to license Dick to promote the file plate process much after the manner in which others, ten years earlier, had been licensed to develop the electric pen process. This he did in 1887 and the A. B. Dick Company at once proceeded to sell the file plate process together with a flat-bed duplicator.

Dick coined the name "Mimeograph" for the file plate process in the form in which he presented it; and ever since stencil duplicating in America, in most of its various forms, has been known by that name. The word comes from "mime" to imitate and "graphein" to write. At that time, in America, as well as Europe, Gestetner's Cyclostyle process had already established "cyclostyling"* as a successful method of duplicating hand-writing by means of a stencil. The word mimeograph, nevertheless, became popular especially after Edison gave Dick permission to call his apparatus the Edison Mimeograph, and the Edison-Dick association prospered.

Some of the biographical works on Edison refer to the electric pen as mimeograph: but a search at the Edison Historic Site in New Jersey showed that the word "mimeograph" was never used by Edison in the days of the Electric Pen and Duplicating Press Company.

It is interesting to reflect that the words "cyclostyling" and "mimeographing", which became synonymous with stencil duplicating on opposite sides of the Atlantic, were associated each with a stencil-cutting tool.

Neostyle

It was about the year 1888 that Gestetner and Klaber began to use the word "Neostyle" for the Neo-Cyclostyle pen and products in the United States. Such products, however, carried the guarantee signature "D. Gestetner". And from that time onwards all Neo-Cyclostyle goods manufactured by D. Gestetner in London and exported to Klaber for sale in America were marked "Neostyle".

An advertisement dated 1889 (see opposite) over the name of The Pennsylvania Cyclostyle Company, Philadelphia, illustrates both the Neostyle

* See again page 67 referring to first use of the word cyclostyling.

The Neostyle Duplicating Apparatus.

For Duplicating Writing, Type-writing, Drawings or Music.

THE "NEOSTYLE" IS THE NAME GIVEN TO THE PERFECTED "CYCLOSTYLE."

The improvements being so important that it really is a new machine, embodying, however, all the advantages of the "Cyclostyle" without a single disadvantage.

2,000 EXACT COPIES FROM ONE WRITING;
EACH COPY HAVING ALL THE APPEARANCE OF AN ORIGINAL.

Invaluable for Circulars, Price-Lists, Market Reports, Specifications, Quotations, Examination Papers, Postal Cards, Notices, Railroad Instructions, Schedules, Reports and Tariffs, Copying Music, Menus, Programmes, Maps, Plans, Diagrams, Drawings, Designs.

The "MAGIC"-Frame Lifts and Discharges Sheet Automatically.

Simple,
RELIABLE,
Economical,



Rapid,
Clean and
DURABLE.

Indorsed by 60,000 Firms, Corporations and Institutions throughout the Country.

The "Neostyle" is the only stencil process which preserves the characteristics of the handwriting, giving a light and heavy stroke, thus giving to the work the appearance of actual writing. The work produced by all other stencil processes is immediately recognized by its dotted and uniform appearance, showing no distinction between up and down strokes.



The claim made by competitors that the Cyclostyle Pen was difficult to write with, requiring practice to learn how to hold it, is entirely answered with the Neostyle Pen—Hold and write with it as you would with an ordinary pen, is the only directions we give.

CAUTION.—The suit pending since 1887 between Edison and ourselves was decided April 5, 1889, by Judge Coxe, of the U. S. Circuit Court, in our favor.

We call attention to the fact that the principles and the details of our process are fully protected by separate and distinct Letters Patent, and we hereby notify the public that suit is pending against several parties infringing these patents by using or selling similar processes; and legal proceedings will be commenced against all parties found using or selling any apparatus infringing any of these patents.

PENNSYLVANIA CYCLOSTYLE CO.,
FRANKLIN INSTITUTE, PHILADELPHIA.

pen and a Neostyle duplicating apparatus, and shows clearly that the word "Neostyle" was used especially for the improved form of the pen—the Neo-Cyclostyle.

This advertisement included in bold black print a reference to a court case decided in favour of the Cyclostyle Company. Research among the archives revealed that this case was brought by the A. B. Dick Company, interested at the time in Edison's electric pen and patent, protesting that the Cyclostyle was an infringement. The court decided in favour of the Cyclostyle and, in the circumstances, this decision clearly emphasised the unique nature of Gestetner's invention. It is interesting also to record that a few years earlier (in 1887) the Cyclostyle had been awarded the John Scott Legacy Medal by the Franklin Institute in Philadelphia for its merits as a stencil-cutting instrument.

In retrospect

The development of the handwriting stencil and the story of its commercial development spanned an eventful period from about 1870 to 1890. But it was only towards the end of that period that the duplicating of handwriting by means of stencils became an accepted and necessary routine in the rapidly expanding office of that time.

For the pioneers it was a period of toil and struggle. There was first of all the work of one or two fundamental inventors thinking hard and experimenting to devise practical means of making copies of handwriting by means of a stencil. Then came David Gestetner's original inventions, the wheel pen and the Japanese tissue for making wax stencils, without which stencil duplicating might never have got off the ground.

Having creative ideas about duplicating by means of stencils is one thing: selling the idea to Victorian businessmen was quite a different matter. They were far too conservative and prejudiced to welcome the change and challenge which it represented. They were afraid of producing copies in the office in such large numbers. They didn't know what to do with them. Copies, to those well groomed gentlemen, accustomed to the personal letter perfectly penned, were something inferior, not to trust, bordering on the fraudulent. It took a long time and some hard selling to convince the late nineteenth-century businessmen of the immense possibilities of stencil duplicating as a convenient and economic means of making large numbers of copies of handwritten matter for the distribution of business information and in advertising.

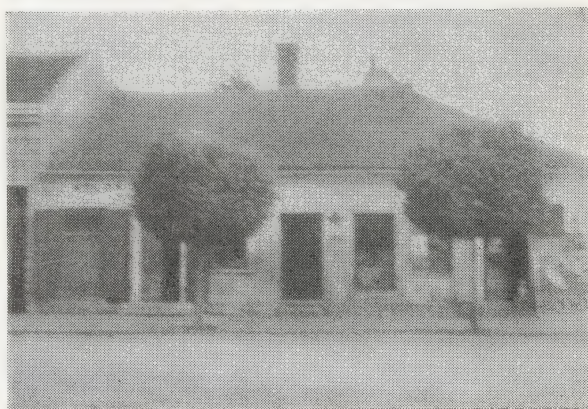
This, however, David Gestetner succeeded in doing. He was a businessman of remarkable foresight, recognising the needs of the market "way ahead of his time". And not only did he sell the idea, he got down to manufacturing the product with great zeal and considerable courage.

Inventor, founder, salesman and manufacturer, David Gestetner devoted his entire energy to the development of stencil duplicating. It is interesting, therefore, briefly to consider his background and upbringing.



Above: David Gestetner (*centre*) en route for USA, 1875.

Below: David Gestetner's birthplace in Csorna, Hungary.



David Gestetner was born in 1854 in Csorna, Hungary: and left school at the age of thirteen in 1867. An unusually bright boy, he earned his keep apprenticed to an uncle making sausages in a shop in Sopron. Four years later in 1871 he went to Vienna and apprenticed himself to another uncle in a totally different kind of business; making money on the Stock Exchange as a broker. In 1873, in Vienna, the great financial crisis occurred. In the same year a world exhibition opened, and Gestetner's parents came to the capital and opened a restaurant. But soon young Gestetner tired of this uneventful life, and off he went to try his fortune in America, travelling steerage, with the proceeds, it is said, of some of his mother's jewellery, pawned on his behalf by a fond parent. On the way to Chicago, to stay with a friend in a tannery, he had the misfortune to have his pocket picked. Granted a loan by a charitable organisation administered by compatriots, he found a job selling Japanese kites. These kites were made of a strong Japanese paper doped or coated with lacquer and David Gestetner noticed with an observant eye the long, strong fibres of a piece of torn kite. He remembered this fact to good effect when, ten years later, he required a new and improved paper to wax for use with his Cyclostyle. There is little doubt that the Japanese paper he employed in his patent of 1885 was of the same nature as that used for the kites.

He spent his two years in Chicago trying to make a success of a laundry business. 1877 saw him back in Vienna, where he went into business with his uncle Leopold making and selling the hectograph process. Uncle Leopold was a glue and gelatine manufacturer. They did not succeed in setting the Danube on fire and the family partnership was dissolved in 1879, in which year the itinerant young David, then 25, went to London.* He obtained employment as an assistant in a stationers' establishment in Shoe Lane, London, EC. off Holborn Viaduct, the address of William Frederick Barton Massey-Mainwaring, trading as Fairholme and Company, where his life's work on stencils began and a new era of success opened up; for himself, and the whole world of communications.

* It is interesting and arresting to know that David Gestetner's first patent, taken out in London in 1879, was not for a stencil but for an application of hectograph in which he formulated a copying ink containing aniline dyes for use in letterpress printing. It was for the rather novel and ingenious idea of using the printed copy as a master for making further copies cheaply on the gelatin pad of the hectograph process. Interesting to note, also, how in the march of progress someone always sidesteps to link the new with the old. This is the way of industrial evolution. For a long time the early automobiles were, and looked like, horseless carriages.



STENCILS FOR TYPEWRITING

From writing to typewriting

By the late 1880's cyclostyling was becoming established as the accepted method of duplicating handwriting. But about that time the office was also turning its attention to the typewriter.

And it was in the late 1880's that the business world conferring on these matters began to realise that the use of shorthand dictation coupled with transcription by the typewriter could liberate office copying procedures from the domination of the pen.* It was then that the typewriter was recognised and adopted as a new tool for the office. And the new tool was accompanied by an equally new phenomenon in office history, the female clerk—the Victorian clerkess†. At first it was she who was called the Typewriter, and it was a long time before the word typist came into use. And one spoke of typewriting rather than typing.

Once the typewriter was accepted, two other important changes in office practice became urgent: one concerned the use of carbons on the new instrument to make one, two, three, or more copies at the time of typing; the other was the immediate need to cut stencils on it so that copies could be duplicated in the large numbers required. The great, and greatly needed, increase in the output of the office of that productive period came about by this bigamous marriage of the typewriter to carbons on the one hand and stencils on the other. The modern office, it may be said, was born of that union.

But handwriting stencils were not suitable for cutting on the typewriter. It was quite impossible to make ink-passing perforations in them. The thin paper used for file plate stencils was too close textured and strong to

* See transactions of the first International Shorthand Congress (President: the Earl of Rosebery), held in London in 1887—a great event in the history of the office.

† The word clerkess is still in common use in Scotland today.

make any useful impression. And even the Cyclostyle stencil with its more porous, long-fibred Japanese tissue was not responsive enough.

The trouble with these stencils was that either they did not respond at all or, if they did, the entire letter was chopped out. Such was the problem when typewriter and stencil came face to face.

The invention, development and production of a typewriting stencil, therefore, was the next important stage in the progress of stencil duplicating.

The problem

The patent literature of this period shows many attempts to make the handwriting stencil, then in existence, work on a typewriter.

Typewriter platens were covered experimentally with sandpaper to simulate the file plate. Edison, much earlier, as already mentioned, had suggested facing the types with small needles. But all to no avail; and much time and effort was expended until a new approach to the problem emerged in the idea that the typewriting stencil base paper or tissue should have a texture like that of the Takamatsu tissue of Gestetner's Cyclostyle stencil, but much more porous. Indeed the tissue required was a special and extremely porous product, enabling the typewriter to push the wax coating aside and expose the tissue in an ink-passing "impression" in which the bridging fibres held the centres of loop letters more or less safely in place.

Following upon Gestetner's original idea, yet another special Japanese tissue was found to perform this function; a handmade tissue of a very porous structure made of exceptionally long, fine and strong fibres. In U.S.P. 377,706 (applied for May 1886: granted February 1888) John Brodrick refers to a special tissue and discusses the new technique of "expressing" or pushing aside the wax coating in the act of typing a stencil based on such a tissue. In this patent he goes on to say, "I now use one of the most porous and thinnest grades of Japanese paper made from the stem fibres of the plant called *Morus papyrifera sativa*, and commonly known in the Far Eastern paper trade as Yoshino; the only kind of paper suitable for this purpose." This open-textured Yoshino tissue was the fundamental means of making the first successful stencil for the typewriter.

Yoshino

Like Takamatsu stencil paper, Yoshino derives its name from its place of origin. It comes from the province of Tosa in Shikoku Island where there is a river called Yoshino. In Japan the tissue was known as Tengujo, Tosa Tengujo the Imperial Gift Paper for making souvenir handkerchiefs for visitors to the Emperor's palace. This was the tissue that Gestetner imported from Japan once he started the manufacture of typewriting stencils.

Berrick Brothers, London, were again the importers of this other Japanese tissue required for this further big step forward in the history of

Selecting Yoshino
paper.
Yokohama Agency

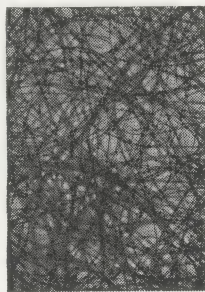


stencils. Berrick Brothers' records show that Takamatsu tissue was first imported in 1885 and that Yoshino imports were first made in 1888: both for delivery to Gestetner, City of London, COD.

Handmade Yoshino paper, as imported from Japan, was the only tissue used in the manufacture of typewriting stencils during the main part of the first half of the twentieth century, in both Great Britain and America. But it was eventually replaced in the 1930's by a machine-made paper using other paper-making fibres. In the pioneering days of typewriting stencils Yoshino was the key.

Under the microscope

In a proper appreciation of the solution of the typewriting stencil problem, it is important to recognise that Yoshino tissue is exceptional in being of such a porous nature that the gaps between the fibres can almost be seen by the naked eye and are easily visible under slight magnification. Yoshino tissue is unique in terms of this degree of porosity, and a fibre of great length, strength, and fineness is required to make it.

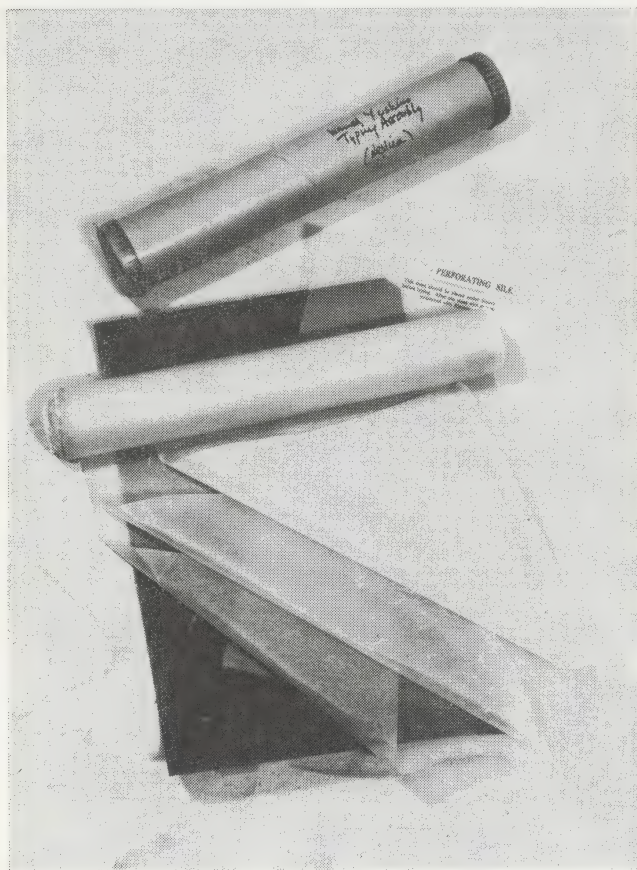


Left: The typewriter e x 4. *Centre:* Letter e x 12 showing the fibre bridges holding the centre of the loop in the typed wax impression in a waxed Yoshino stencil. *Right:* The Yoshino base paper x 25.

Once again the microscope reveals the stencil tissue secret. The photomicrographs show how the type makes its impression in a waxed Yoshino stencil. They should be compared with the corresponding pictures of the Cyclostyle perforations in a handwriting stencil on page 64 in order to appreciate the progressive increase in porosity of the paper from Takamatsu to Yoshino.

The first typewriting stencil

Although waxed Yoshino was the basis of the first successful laboratory typewriting stencil, it did not immediately provide the office with a commercial product. There were many problems still to be solved. The



The first typewriting stencil.

This formidable assembly of sheets was sold rolled up in a cylindrical box containing stencils, muslin sheets and diaphragms (a quire of each) together with one perforating silk and one oiled board.

patent literature for the next ten years or more contains many ingenious suggestions for making the basic product work and the names of Gestetner and his American agent appear frequently and that of Dick, who was now actively making mimeographs in America. They were all keen to improve this product with such a universal sales potential. First of all the wax had to be modified—"shortened"—by the addition of tallow to make it respond to the impact of the type. But, as it then stuck all too readily to the type, it was necessary to use a special thin tissue called a muslin sheet on top of the stencil when typing so as to trap the removed wax and protect the type.

But even so not enough wax was removed to form a good perforation and it was necessary also to place behind the stencil a sheet of bolting cloth or silk gauze, called the perforating silk, in order to get rid of more wax by enmeshing and holding it in the interstices of the weave.

Typewriter platens in those days were all too often pitted by the type and it was customary to type the stencil on a sheet of oil-board, inserted to provide a better typing surface.

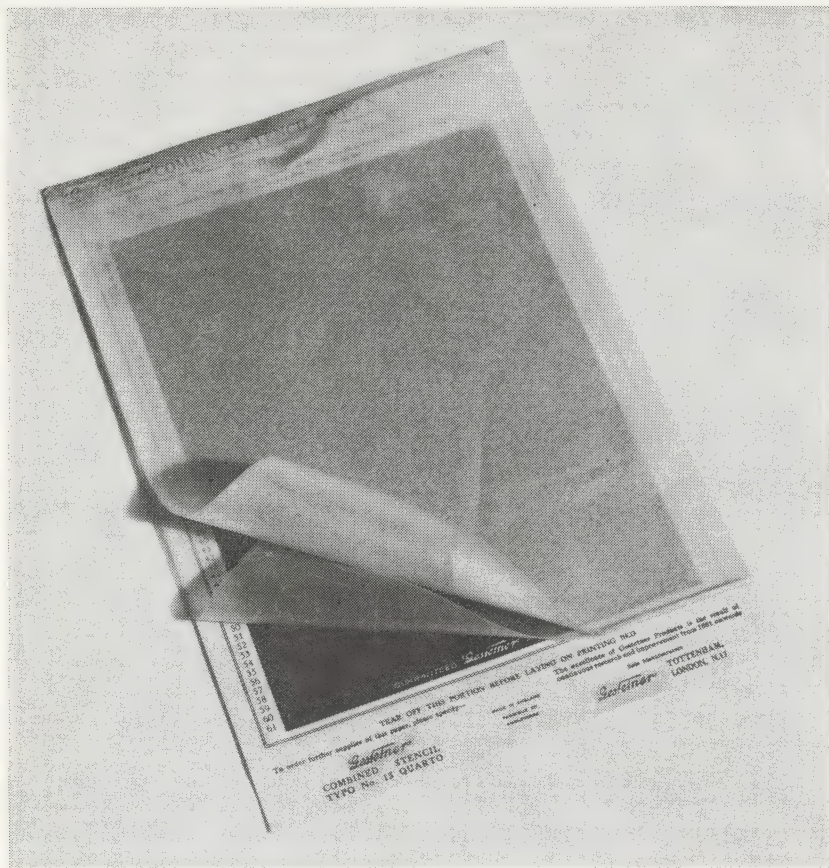
Typed and separated from its various companion sheets, the typewriting stencil was clamped in the frame of the flat-bed duplicator just like a handwriting stencil, which it equalled in size. But whereas the handwriting stencil was robust enough for inking directly with the inking rollers, the typewriting stencil was delicate and required the protection of some form of ink-screen to come between it and the roller. A sheet of unwaxed Yoshino was used for this purpose, strengthened usually by previous impregnation with a shellac varnish. This strengthened sheet—ink-screen, or diaphragm as it was called—was clamped on top of the stencil and "took the ink".

Such then was the first typewriting stencil—a formidable assembly of large sheets—muslin sheet, stencil, perforating silk, with oil-board and ink-screen to boot. This was the primitive ancestor of the slick one-piece stencil of today. Let's pay silent tribute to the first stencil typists for their patience and endurance with such a child.

The ingenious ways in which improvements in design and presentation were effected are described in the next part of our story.

Improvements

One of the first improvements came as a result of dealing with the special problem of using typewriting stencils on the flat-bed duplicating apparatus of that day. Whereas the handwriting stencil was clamped in the frame of the duplicating box and *then written on with the wheel pen*, the typewriting stencil was *first of all typed in the typewriter and thereafter clamped in the frame*. Once in the frame, the typed impression with its delicate fibre bridges could suffer stretching and distortion from the tension of clamping. It was therefore necessary to provide the typist with some means of avoiding the clamping operation. This was done by the simple but



An early form of typewriting stencil.

ingenious decision to make stencils smaller so as to fit within the frame and thus do away with the need for clamping. Incidentally, it did away also with the awkward and damaging practice of folding them to fit the typewriter. (There were no long-carriage typewriters in those early days of duplicating.)

This change, however, brought with it new problems. For instance, it became immediately necessary to wax the marginal regions of the diaphragm (the ink-screen) in order to prevent passage of ink round the edges of the small stencil.

And how did the stencil "stay put" on the frame, now that it was too small for clamping in position? To answer this consider briefly the operation of making copy with such a stencil on a Neo-Cyclostyle duplicating

apparatus. The stencil was laid face-up, flat on the bed of the duplicating box, and the diaphragmed frame closed down over it. Ink was rolled on with a handroller and the frame immediately raised. The stencil was found adhering to the diaphragm, kept there by the layer of ink. And it remained there safe and sound. The bed of the apparatus was cleaned and a piece of duplicating paper laid on it and the frame, this time with stencil in place, closed down once again, and the inking roller applied once more. The operation was repeated until the run was completed.

The next improvement was to replace the expensive perforating-silk with a sheet of absorbent but firm paper. It became possible by this step to afford one sheet of paper per stencil, and in this way the traditional stencil backing sheet came into being.

Moreover, the muslin sheet, stencil, and backing sheet could now be neatly fixed together along the top edges by means of a line of wax. A much smarter assembly was emerging—much more convenient for typists to handle.

Other refinements became possible. The backing sheet was printed with an outer frame of guide lines and an inner solid black. The guide lines could be seen by the typist through the transparent wax, and the solid black enabled her to see the typed matter as the broken wax showed up against the dark background.

Backing sheets were sometimes printed in solid blue, or green, or some other dark colour. This was done for the additional purpose of identification since different waxes were required according to whether the stencil was destined for a hot, cold, or temperate climate. This was a refinement necessary for typewriting stencils only, not for handwriting, and was connected with the fact that typewriting-stencil wax was quite different from the ordinary wax used for handwriting stencils. Much modified, as already mentioned, to make it more responsive to the typewriter, it became also more responsive to temperature.

The Gestetner version of this now elegant stencil with the modern touch was called "The Combined Typo Stencil No 15" and its appearance on the market marked one more big step forward in the commercial progress of stencil duplicating.

Nowadays, one inserts a carbon between stencil and backing to cushion the impact of the type and to render the typescript visible, and many readers may be puzzled by the omission of any mention of them in connection with these original wax stencils. But carbons were not used with wax stencils. Carbons are also made of wax and their use would have led to a fusing up of stencil and carbon under impact of the type; and this, of course, is what the whole stencil assembly was designed to avoid.

Stencils in those good old days were called "waxes". But nowadays they are no longer made of wax; although it is common enough still to speak of them in the trade as wax stencils or wax coated. Modern typewriting stencils are coated with a composition of the plastic substance known as nitrocellulose, skilfully plasticised with oils to make them

Supplement to The "Gestetner" Manual. 1.WAX STENCIL PAPERS.

1. WAX STENCILS for TYPEWRITING. Wax being, as is generally known, affected by changes of temperature all GESTETNER stencils are graded to suit the weather, or the typewriter.

The different grades are easily recognised by the colour of the backing sheet, viz. Blue, Black or Green.

BLUE

FINE Stencils -

For cold weather, when other grades become too hard; for light touch typewriters, or for those where the type is worn or the platen soft. This grade will not give so many copies as the other grades because the texture is so much finer.

BLACK

STANDARD LIGHT MEDIUM Stencils -

For the majority of typewriters in good condition. For the typist with a firm staccato touch. This grade gives more copies than the blue backing and should be used in the hot weather, in place of it.

GREEN

EXTRA HEAVY Stencils

These stencils are of a heavy texture and should only be used on very hot days.

THE STENCIL and the ART of CUTTING.

The stencil is the master from which your copies will be made - every fault in your original, unless corrected, is going to be perpetuated in each copy run off.

It cannot be too strongly emphasised that the whole success of your work is going to depend on how your stencil is cut.

pressure-sensitive; that is to make them respond to the impact of the typewriter. Compared with the old waxes they are much more resistant to creasing and cracking and they can be used in a wide range of climatic conditions. The modern stencil, indeed, is robust and dry enough to take its place as a piece of office stationery.

CUTTING THE STENCIL

Type with an even staccato touch. Do not use more than one finger on each hand to strike the keys so as to ensure that each letter gets exactly the same tap. This is because one does not exert the same pressure with the 4th or 5th fingers as with the 2nd or 3rd.

Use the 2nd finger for preference

Generally it is advisable to strike certain capital letters such as M, W, and E. harder or even twice. This is done by holding down the spacing-bar while striking.

And Finally

Take out the completed stencil from the typewriter and lightly rub the tissue sheet with fingers prior to lifting up. This will ensure that the centres of e's and other loop letters, and the o's and c's are not pulled out when the tissue is removed. If any letters have been cut out it will be necessary to replace them by picking them up with a pin and putting them back and pressing them into place with a warm finger. If you cannot find the missing cut-outs you will have to punch them afresh from a piece of spoilt stencil.

DEVELOPING THE STENCIL

Examine the finished copy for faulty letters and brush DEVELOPING FLUID over any of them to clear away the wax, using a small brush. Sometimes it is advisable to use a larger camel-hair brush and go over the entire stencil.

DOCTORING THE STENCIL

Examine the stencil for obvious cracks in the wax and stop them up by means of Protecting Varnish. It may be necessary to repeat the operation when the stencil is in the duplicator.

CORRECTING ERRORS

Correct by either of the following two methods:

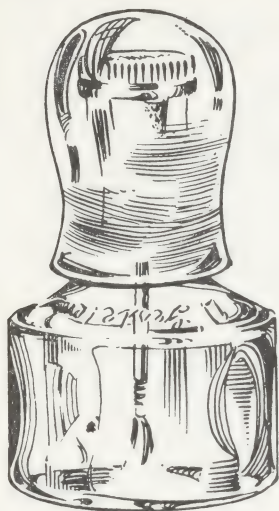
(a) Using Correcting Fluid. After removing stencil from typewriter but before taking the muslin tissue off, tear off the tissue just over the error. Insert a round object, such as a pencil, between the wax sheet and the backing sheet just above the error and brush over with CORRECTING FLUID. Allow to stand a few moments until dry, and lightly re-type. If the error is observed whilst typing it is not necessary to remove the stencil from the machine. Just turn the work forward, tear off the small piece of tissue, insert the pencil, brush over, allow to stand, turn back and re-type. Never correct by stamping over unless it happens to be letters which coincide, such as O over C, or I over L.

(b) By Grafting. If a whole paragraph or several lines have been wrongly typed, cut out the faulty portion with a sharp knife.

Re-type the paragraph on a piece of waste stencil paper, cut it out to a size which while fitting the opening in the original stencil still allows an overlap.

To affix the graft, lightly paint the edges of the opening on the stencil with ADHESIVE VARNISH and place the graft in position. Take care that the graft is in alignment with the rest of the work; do not use too much varnish and see that none creeps underneath as this would clog the carrier.

The gentle art of typing stencils.
Pages from a Gestetner Manual on the art of typing stencils originally issued about 1900.



Gestetner's Stencil Developer.

DIRECTIONS FOR USE.

If any letter in the Stencil, owing to imperfect perforation, is indistinct, lightly paint the defective portion with this Developer and allow to dry. A second application may be required, but use sparingly and only where absolutely necessary. Any blur will disappear after a few copies. Genuine only if signed thus:

J. Gestetner

NEO-CYCLOSTYLE CORRECTING FLUID.

Brush over word to be erased, when correct word can be written over, after one minute. It is also useful for preventing spots of ink coming through stencil. Always cork directly after using.

(Neo-Cyclostyle, Gestetner's Patent).



First aids for early stencils



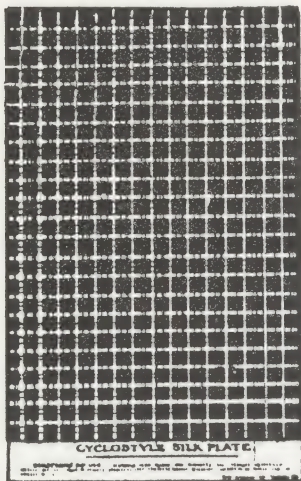
NEO-CYCLOSTYLE PROTECTING VARNISH.

Very useful for preventing spots of ink coming through stencil. Paint with the cork over desired place to be protected (at the back of stencil, inside the frame). Keep bottle well corked.

(Neo-Cyclostyle, Gestetner's Patent).

Typists soon found that they could also write on a typewriting stencil with an ordinary metal stylus, which was quite capable of pushing into or expressing the wax to make a good ink-passing perforation. As with the typewriter the perforation was improved by inserting a sheet of some kind behind the stencil to assist in removal of the wax. The old perforating-silk was brought into use again for this purpose. It was placed as a covering over the wheel-pen zinc-plate, converting it into a silk-plate for use with a metal stylus and typewriting stencil. The silk was duly folded over and gummed in place at the back of the plate. As a writing guide, to be seen through the silk, a piece of paper with black squares and white lines was gummed on the front of the zinc before placing the perforating silk over it. It became an important accessory; for handwriting on typewriting stencils was increasing in use and importance as typewriting stencils gradually replaced handwriting stencils—a change-over that took many years to complete.

The modern counterparts of these products in the form of plastic sheets suitably surfaced are in use today in stencil work. Nowadays standard stencils are for typewriting and there are special stencils for handwriting. In the early pioneer days the standard stencil was for handwriting: typewriting stencils were the innovations.



Cyclostyle silk plate.

For handwriting with stylus on typewriting stencils. Consisting of a piece of paper with black squares and white lines pasted on a zinc plate and covered with a sheet of silk gauze.

Automatic duplicating

With handwriting and typewriting stencils more or less perfected and both available in the small size suitable for fitting within the frame of the duplicating apparatus, attention was turned to improving the duplicating box itself. Here again Gestetner, Klaber, and Dick and their assignors appear in the patent literature with various suggestions for improving this centre-piece of the duplicating business.

It soon became obvious that the Neo-Cyclostyle duplicating apparatus could cope very successfully with the increasingly popular stencil of smaller size, if the frame were provided with a wax-margined diaphragm, gummed permanently in place. It was better still to make such a diaphragm more robust than a varnished sheet of Yoshino tissue. What could be used instead? What more suitable and durable than the versatile and ubiquitous perforating silk? So it came about that the "Neo", as the Neo-Cyclostyle duplicating apparatus was by that time affectionately called, was issued with a silk-diaphragmed frame.



Gestetner Diaphragm Duplicators.

Various attempts were then made to make the whole apparatus more or less automatic. The hinged frame was spring-loaded to make it self-raising, ideas were put forward for ejecting the paper after "printing", and the conception of automatic inking was studied. Much thought and effort also went into making such models attractive in appearance, quicker and easier to use. They were sometimes called diaphragm duplicators. In the course of the years several of these diaphragm duplicators were marketed by Gestetner in addition to the Neos and some of them carried the tradition of flat-bed duplicating right up to the 1950's.

But going back to the 1890's, when these developments were taking place, we must deal now with the really important event in the history of stencil duplicating at that time—the appearance on the market in 1893 of David Gestetner's Automatic Cyclostyle duplicating apparatus. He had been granted a patent for this remarkable invention in 1891.

The new and revolutionary feature of this machine was not so much the automatic raising and lowering of the stencil frame, but the arrangement of rollers by which the stencil was automatically inked. The object of the patent was: "To provide means for automatically passing the stencil-stretching and printing frame to and fro under an inked printing roller or vice versa: and means for automatically lowering and raising the said inking rollers on the said stencil".

It came to be called the "Automatic Cyclostyle" and stood out as a major contribution to the progress of stencil duplicating machines and is regarded as a highlight in the history of duplicating design.

The Automatic Cyclostyle, however, did not oust the "Neo" or its elegant modifications, which continued well into the twentieth century, long after the first world war, whereas production of the Automatic ceased round about 1910. But in its brief period of popularity the Automatic had served the important purpose of pointing the way to the next great stage in the history of stencil duplicating, the rotary method; quicker, more convenient, and more genuinely automatic. It was in the automatic operation of the ink-screen and in the automatic spreading of the ink by rollers that all the potential elements of rotary duplicating resided.

Stencil business 1885 to 1895

It is convenient at this point to continue the commercial story of the progress of the stencil business during the brief, but busy period, from 1885 to 1895. At the beginning of that period the business was concerned with the development, manufacture, and sale of flat-bed duplicating apparatus, handwriting stencils, and the latest product, typewriting stencils, together with all the accessories, the wheel pens and styli, zinc plates and so on.

Gestetner's small factory in Sun Street in the City of London had not proved big enough and he had moved first to Chequers Alley round the corner and then to larger premises not far away in Chiswell Street, where



A historic 1893 photograph shows the founder of the Gestetner Company, David Gestetner, demonstrating the automatic version of his original invention.

he occupied the two upper floors of the building and employed about sixty people. Here the manufacture of the duplicating apparatus was taken over from Fairholme and Company as the young Gestetner company became responsible for the complete range of products.

On the sales side of the business at that time Gestetner was selling these stencil duplicating products in Great Britain through Fairholme, his original employer and patron. In America he sold them under the name of Neostyle through his agent Klaber. And it was about this time in America that Dick revived the file plate stencil process, calling it Mimeograph, and commenced manufacturing and selling stencil duplicating equipment under that name.

In Europe Gestetner had direct selling rights in his native land, Austro-Hungary, where he established agencies with members of his family. It is interesting to record that there was no indigenous stencil duplicating business in Europe and the spread of this new office process to other European countries resulted from young Gestetner's eagerness to open agencies in the various capitals of Europe. Fairholme and Company as British stationers were not so interested in this continental business.

Back in London in 1893 Gestetner's Automatic Cyclostyle duplicating apparatus was launched on the market, and advertisements for it began to appear in the magazine *Knowledge* from 1894, over the name of the Cyclostyle Company. They make interesting reading, and the illustration in the one reproduced opposite gives a good idea of how the apparatus worked. "Price £3 3s. Patented in all civilised countries. Infringers prosecuted to the full extent of the Law." With such aggression pioneers were forced to fight to protect their products even in the most civilised countries of the world. The whole story of the commercial progress of the stencil business shows that the Law at that time was much in use as a weapon of competition. And competition at that time began to take shape when various stationers, who were the only outlet for office goods, began to make and sell "inferior copies of the original products".

About the beginning of the 1890's in America, Gestetner was experiencing the effects of some competition from within his own organisation. Klaber in New York was becoming more and more independent, and in 1893 formed and registered a company in New York for the sale of stationery and other products additional to the Neostyle goods supplied by Gestetner from London. And he called the company the Neostyle Company. Gradually the business relationship between Gestetner and Klaber deteriorated. In the text of the last agreement between them, dealing with the goods concerned in contracts, no mention was made of Gestetner's latest masterpiece, the Automatic Cyclostyle duplicating

Opposite: From *Knowledge* 1st October 1897, an advertisement for the Automatic Cyclostyle "patented in all civilised countries".

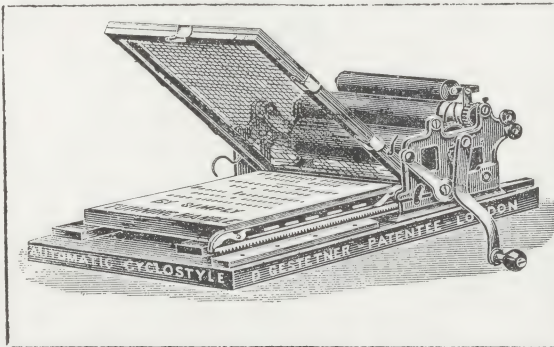
THE AUTOMATIC CYCLOSTYLE

(GESTETNER'S PATENT).

Prices from £3 3s. Patented in all civilized countries. Infringers prosecuted to the full extent of the Law.

A FEW ADVANTAGES.

1. No skill required. The work being done by the Machine automatically, a novice can at once obtain perfect copies.
2. Great uniformity of copies. The pressure being constant and regular, the copies are all alike.
3. The process of re-inking is made much easier and cleaner. One inking suffices for 100 to 200 copies, but 2000 copies may be taken from one stencil.
4. Equally adapted for reproducing written or typewritten matter.
5. Great speed in taking copies. It is only necessary to turn a handle which lifts and lowers the frame, and time is gained by having a less number of re-inkings.



MODE OF WORKING.

Producing the Original. The Original Writing or Drawing is done with the Neo-Cyclostyle Pen, as easy to use as an ordinary pen.

Copies of Typewriting. The Automatic Cyclostyle is particularly adapted for copying typewritten matter. The pressure of the inking roller as well as the distribution is regulated automatically by the Automatic Cyclostyle. The mystery which is frequently found to surround this process is all cleared away by means of the Automatic Cyclostyle.

Printing. Simply turn handle of Machine.

THE AUTOMATIC CYCLOSTYLE, comprising a complete outfit for reproducing either written or typewritten matter.

PRICE—Octavo size, £3 3s.; Quarto size, £1; Foolscap size, £4 4s.; Avoue size, £4 10s.

Outfit for reproducing Typewriting, Octavo size, 10/6; Quarto size, 11/6; Foolscap size, 12/6; Avoue size, 14/6. Fitted with unmeltable rollers for Hot Climates, 21/- extra, any size.

To those who require a cheaper process, less easy of manipulation, the following may be found suitable at lower prices—

THE "NEO-CYCLOSTYLE" HAND-ROLLER PROCESS

For Duplicating Typewriting and Handwriting. (Gestetner's Patent).

This is a simple and perfect process for producing copies of Typewriting or Handwriting, by means of which 1000 copies may be taken equal to original Typewriting or Handwriting in black indelible ink. It may be used with any Typewriter.

THE ADVANTAGES CLAIMED FOR THE CYCLOSTYLE OVER OTHER PROCESSES ARE:—

- | | | |
|---|--------------------------------------|--|
| 1st.—Superiority of Work. | 4th.—Economy in Use. | 7th.—No Gelatine Messes. |
| 2nd.—Number and Uniformity of Copies. | 5th.—Rapidity. | 8th.—Any Error may be Rectified. |
| 3rd.—Extreme Simplicity and Durability. | 6th.—No Rough Surface to Write Upon. | 9th.—No shifting up of Stencil in Writing. |

For Printing Reports, Specifications, Price Lists, &c., it is invaluable, and soon repays its cost.

PRICES FROM 25/-

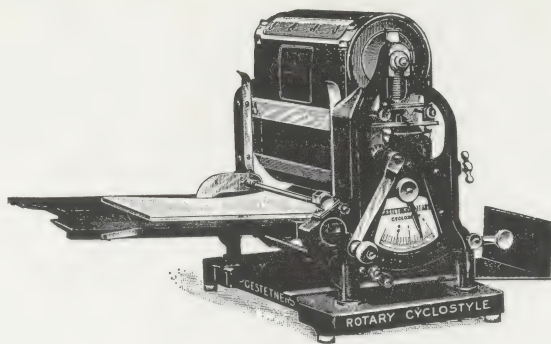
Unmeltable Rollers for Hot Climates supplied at an extra cost.

THE CYCLOSTYLE CO., 34, Snow Hill, London, E.C.

apparatus. Gestetner was reserving the right to make other arrangements for the introduction of that important piece of office equipment into the United States of America.

And so it came about that in 1893 David Gestetner and Albert Blake Dick entered into various reciprocal business agreements concerning the manufacture and sale of stencils and stencil duplicating apparatus in Great Britain and America. The Yoshino-based typewriting stencil of the Brodrick patent, which Dick had acquired, and Gestetner's Automatic Cyclostyle duplicating apparatus were the chief items concerned. Copies of the agreements and related correspondence between Gestetner and Dick reveal a fairly friendly relationship based on mutual respect and understanding. It is interesting to read letters from Dick on holiday in Paris to Gestetner in London, in which the techniques and economics of the stencil duplicating business and its future are discussed in an expert and lively way.

About this time the word duplicator came into use; and with it came the name of a new and additional promoter of stencil duplicating products. The word was used for the first time in an advertisement in *Knowledge* dated 2nd December 1895, by the Ellams Duplicating Company. A few years earlier the Ellam brothers, Frederick and James, had entered the stencil duplicating field; at first as promoters of sales rather than as pioneers of the process. They set up in business first in Manchester and then in Holborn not far from the Fairholme shops. There is a British patent dated 1896 in the names of J. and F. Ellam for a flat-bed stencil duplicator with frame raised by a spring. This indicates the point at which they came in on the development of duplicating apparatus. They remained active during the subsequent development stages which brought stencil duplicating over the threshold of the twentieth century, and they made many independent technical contributions to its progress.



BEGINNING OF A NEW ERA

The "modern" office

In the last few years of the nineteenth century, development in the stencil duplicating industry was concerned with modifying the flat-bed duplicator to make it more or less automatic. This led rapidly to the completely different principle of laying the stencil on a drum, or over cylinders, which could be rotated by turning a handle like a small mangle. Rotary duplicating thus became possible with a much increased speed of operation, higher efficiency, and greater convenience.

The introduction of rotary duplicators in the early 1900's was the beginning of a new era in office history. With rotary duplicators in daily use, typewriters, telephones, and electric light installed and established, the office for the first time acquired that look which we today would recognise as "modern". With rotary stencil duplicating the office was able to meet the business demands of the day, which were increasing steadily in their extent and diversity. Businesses large and small were realising the value of advertising by means of the circular letter produced in the office or in the embryo publicity departments that were coming into being. It was cheaper and quicker than through the medium of the press or directly from the printer, and much more personal. Mail order business was beginning to get under way and stencil duplicating provided the instant means for the follow-up letter and other communications connected with this new form of trading.

Other new methods of trading with an increasingly affluent public were being introduced. Gordon Selfridge was bringing his department store concept to London from Chicago. Marks and Spencer's penny bazaars were beginning to link up and form the chain store idea. And both had need of stock lists, price lists, advertising leaflets, staff communications,



The beginning of a new era in the office.

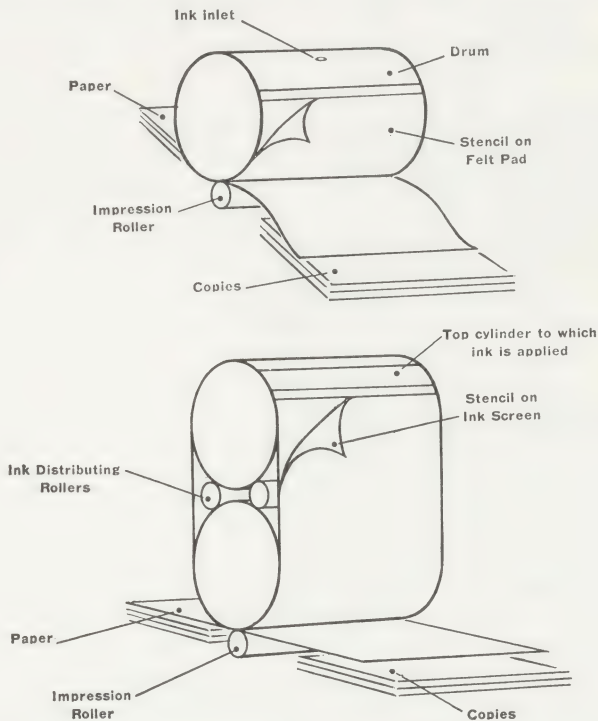
and various other items of information beyond the typewriter's capacity and too urgent and intimate for the printer. All of these the stencil duplicating process could adequately provide.

Schools and colleges were adopting duplicating for their various internal publications, examination papers, class notes, diagrams, graphs, and so on. Churches and clubs could "print" their own magazines. The market potential for the stencil process was enormous. It is on the threshold of this happy hunting ground at the beginning of the twentieth century that we leave our story of the origin of stencil duplicating. The rotary

duplicator set twentieth-century stencil duplicating on its way. It will be interesting, therefore, to conclude our history with a chapter recording how these rotary stencil duplicators came into being and with a brief account of how David Gestetner, founder of the stencil business, consolidated his Cyclostyle Company at the turn of the century.

Two kinds of rotary duplicators

As emphasised already, it was Gestetner's Automatic Cyclostyle with its self-raising ink-screen, inked more or less automatically by rollers, that pointed the way to the much quicker and more convenient rotary system of duplicating. The first step was to remove the silk ink-screen from the rigid frame of the flat-bed duplicator and drape it round a pair of cylinders or a drum. The next step was to apply ink to the ink-screen. This could be done in two ways. One way was to place the ink inside the drum, from which it passed through perforations in the metal to reach a pad of felt, acting as an ink-screen, and lying on the outside of the drum, where it supported the stencil. The other way was to pass the silk ink-screen round two cylinders placed one above the other and apply ink from a bottle or



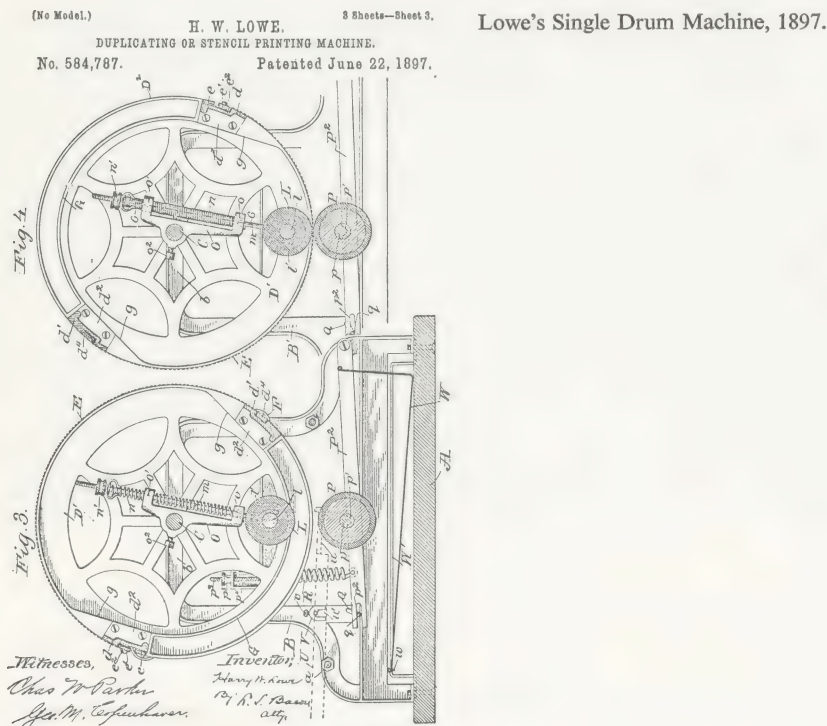
Two kinds of Rotary Stencil Duplicators.

Above: Single-drum system. Below: Twin-cylinder system.

tube to the outside of one of the cylinders. The ink found its way through the ink-screen on to the stencil supported thereon. Finally, in either case, an impression roller pressed the copy paper against the inked stencil as drum or cylinders were rotated by turning a handle. See page 101.

The single drum system was marketed by A. B. Dick as the Rotary Mimeograph and by A. D. Klaber as the Rotary Neostyle, both working on an American master patent of 1896 by Henry W. Lowe. Quite independently in England the Ellam brothers patented a machine in the same year based on the same principle. Gestetner alone worked on the twin-cylinder system which he marketed as the Rotary Cyclostyle.*

There were many engineering problems to be surmounted concerned with holding the stencil on round, rotating surfaces, and feeding sheets of paper synchronously to make copy in register, apart altogether from questions of inking and ink-control. Consequently these machines took several years to develop before they all began to appear more or less simultaneously on the market in the first few years of the new century.



* The rotary principle had been established before 1890, but as a method of repeating designs on wallpaper and fabrics. In 1889 H. B. Thompson of America patented a web-fed rotary stencil duplicating machine. But there is no doubt that Lowe's patent is the one from which all single drum rotary duplicators descended.

In the following account of the patents, machines, and people concerned in these important end-of-the-century steps in this history we deal first with the single-drum system and then with Gestetner's twin-cylinder machine.

The single-drum machine patents

Outstanding in the earliest group of patents for this kind of machine was the United States patent, applied for in 1896 by and granted in 1897 to Harry W. Lowe of Omaha. It was for a highly sophisticated machine involving a robust, perforated drum, rotated by a handle and fitted with an internal ink-reservoir and an internal roller for pushing the ink through the perforations of the drum on to the felt pad on which the stencil was laid. Externally an impression roller pressed the copy paper against the stencil and mechanical means were provided to make this action synchronise with the rotation of the drum.

It was this master patent that eventually resulted in a marketable machine in America. It stands out as the centre-piece of the single-drum rotary idea. The first commercial rotary duplicators based on this principle, indeed, were very much more primitive in structure and performance than the one comprehended by the patent. That of course is often the way of industrial development.

Rotary Neostyles

Soon after the patent was granted Lowe gave A. D. Klaber an exclusive licence to manufacture and sell a rotary machine based on this patent. Klaber, originally Gestetner's agent in the United States of America, was now operating quite independently. Already he had formed in 1893 the Neostyle Company of New York, as mentioned previously, and in 1899 further far-reaching agreements between Klaber and Lowe were entered into and rights in the patent were eventually sold to Klaber. Machines based on Lowe's patent, called Rotary Neostyles, were manufactured and sold in America in 1899.

Later in 1899 Klaber sold his interest in Rotary Neostyle and came to England where in 1900 he took out several patents for modifications and improvements of the Lowe machine, which he refers to in the patent as "apparatus known in the trade as Rotary Neostyle and in accordance with the Lowe patent". In 1900 he also formed and registered the Neostyle Manufacturing Company, London, England, and in the following year marketed a Rotary Neostyle in Great Britain.

A year later in 1901 Klaber obtained a Trade Mark registration for the word Neostyle. A situation was thus created that was inimical to the Gestetner Cyclostyle business, especially at the time when Gestetner was patenting and developing his own rotary duplicator based on an entirely different principle. It was a clash of interests that had to be resolved at the High Court of Justice and an account of the proceedings and consequences is given later in the chapter.

Rotary Mimeographs

In 1899, A. B. Dick of Chicago also obtained a licence to make and sell duplicating machines based on Lowe's patent and in 1900 and the immediately ensuing years he obtained British and American patents for certain improvements in rotary duplicating apparatus also quoted as "known in the trade as Rotary Neostyle and according to the Lowe patent".

A single-drum machine based on this patent was marketed by A. B. Dick and introduced as the Rotary Mimeograph. Like the Rotary Neostyle, it was more primitive in design and performance than the machine envisaged by the master patent. No doubt this simplification made manufacturing easier and simpler.

Ellam's Rotaries

As already mentioned, Ellam's patent for an independent single-drum rotary duplicator is dated 1896. In the early 1900's there were several other patents in the names of J. and F. Ellam for modifications and improvements of the 1896 idea, and duplicators based on those patents appeared on the market at about that time.

The Gestetner twin-cylinder patents

The Gestetner patents were for the completely different twin-cylinder principle. There are three British patents covering the birth of this machine, and three corresponding American patents all taken out by David Gestetner between 1900 and 1902.

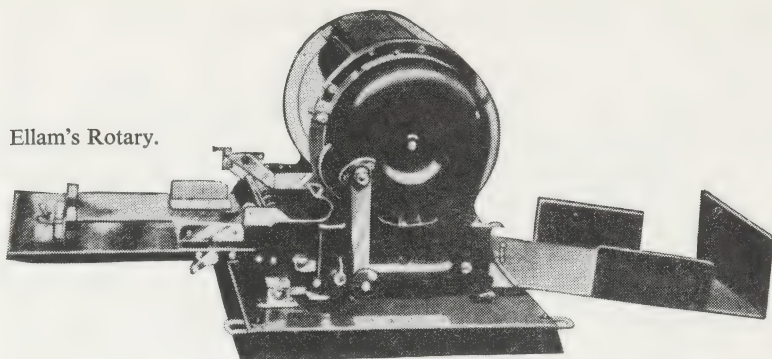
The first British patent applied for in 1900 and granted in 1901, was for an improved stencil printing apparatus comprising, *inter alia*, a pair of cylinders with steel driving bands, an ink-screen, ink-distributing rollers, an impression roller, and feedboard for paper. It covers a comprehensive piece of mechanical engineering and envisages a robust machine based on having two cylinders mounted one above the other and rotated by turning a handle.

A further patent applied for in 1901 and granted in 1902 was for a very long list of practical improvements to the machine. It was by means of such improvements that—to quote the patent—"the said machine was rendered very effective in use".

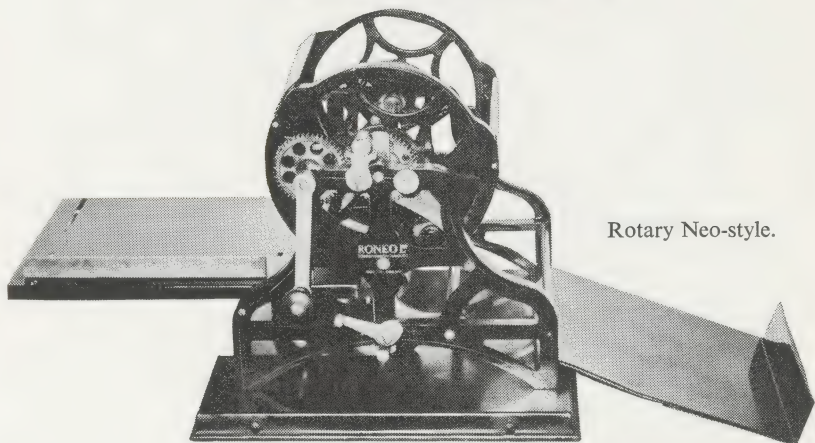
The third British patent applied for in 1902 and granted in 1903, dealt with a paper-heading for the stencil, punched with four key-holes, by means of which it was attached to the machine and carried round the cylinders.

Five years later, in 1906, David Gestetner's brother Jacob took out a patent for "the more effective use of a large number of studs so arranged as to form a signature or trade mark, the stencil sheets having a corresponding number of perforations to fit the studs". This signature-heading was registered as a trade mark in 1909, became a characteristic of Gestetner stencils, and has so remained until the present day—although much modified in design over the years.

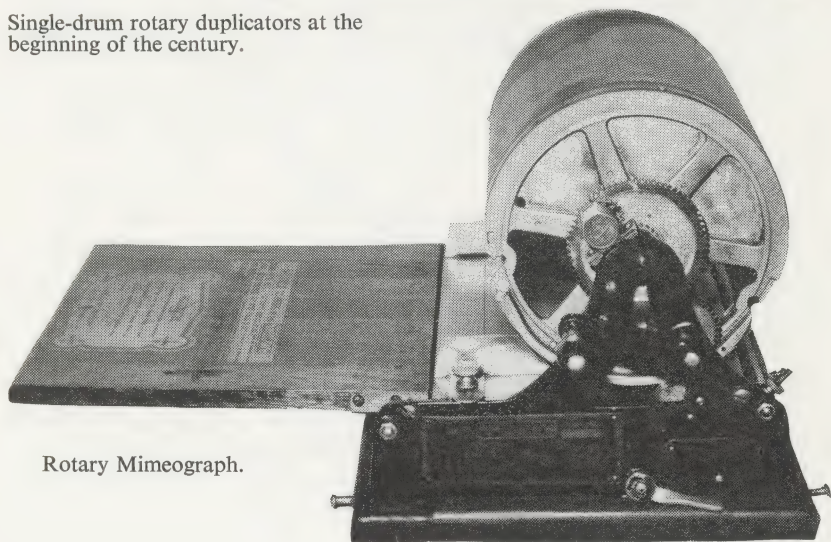
Ellam's Rotary.



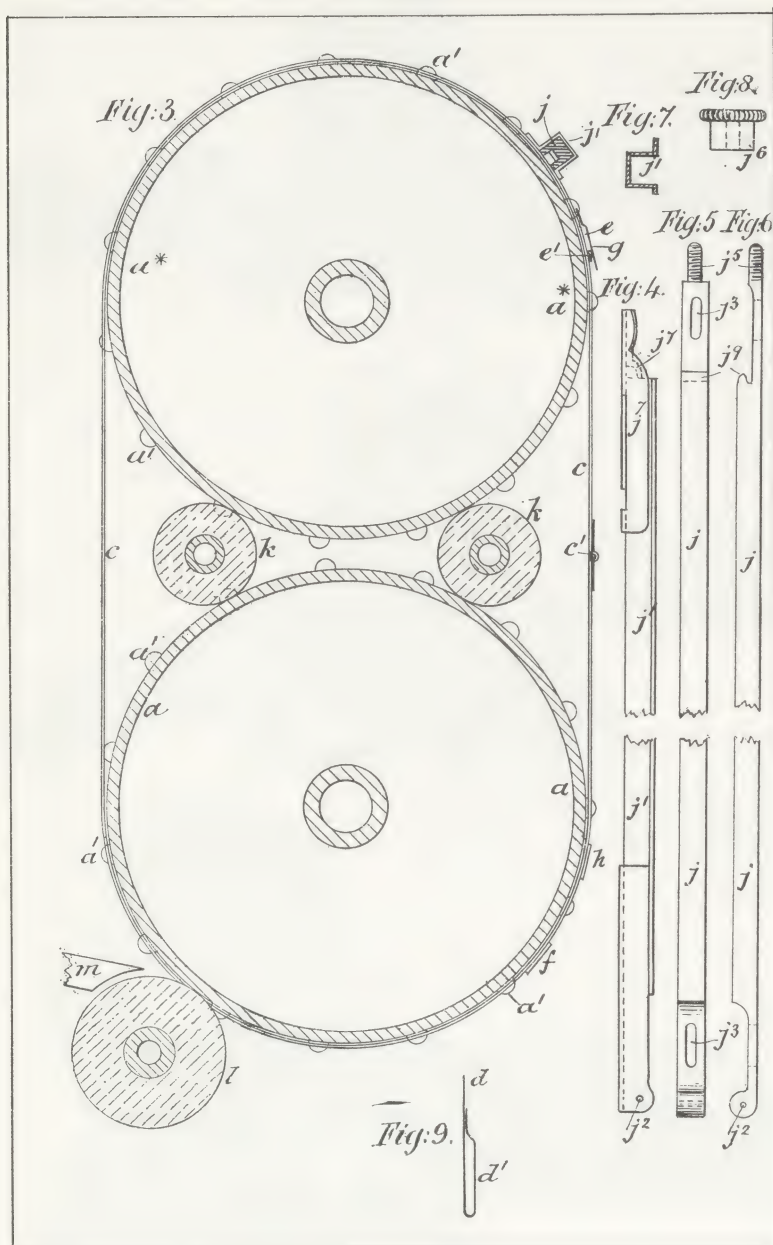
Rotary Neo-style.



Single-drum rotary duplicators at the beginning of the century.



Rotary Mimeograph.



Gestetner's twin cylinder machine, 1900.
 "A.D. 1900, Dec. 21. No. 23406.
 Gestetner's complete specification."

The Rotary Cyclostyle

The first twin-cylinder duplicating machine based on the Gestetner patents was called the Gestetner Rotary Cyclostyle. The word Cyclostyle had come to stand for the machine as well as the pen in those early days of the century when stencil duplicating itself was known as cyclostyling. The marketed model stood on a metal base-board and had a wooden feed-board on which the copy paper was placed one sheet at a time. The metal framework of moulded castings was beautifully japanned and figured in gilt. A picture of this historic machine which is in the Gestetner Museum, is shown on page 108 and depicts it on a period table—the epitome of Edwardian elegance in office equipment and furniture.

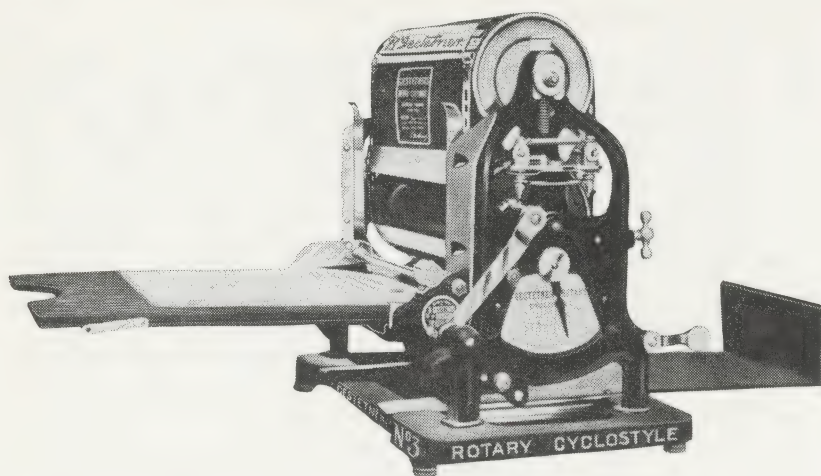
It is this model that is familiar to collectors of early Gestetner machines and they refer to it as the famous No 3. In spite of far-reaching improvements in design and performance of later Gestetner rotary duplicators, the No 3 Rotary Cyclostyle continued actively in office use as a hand-fed machine for the whole of the first half of this century. Indeed it was not until 1950 that it was discontinued. It was called the No 3 because in 1900 and 1902 two prototype models preceded it. In the Gestetner Museum there are several examples of these earlier prototype models with wooden not metal base-boards, and using Yoshino-tissue instead of silk ink-screens.

With the Rotary Cyclostyle, duplicating in the office became quick and easy. Thirty to forty copies a minute could be run off—all by the turn of a handle. We must recognise that handle-turning in those days was the means of making things relatively automatic. Quality of copy was good and the variety of work obtained for circular letters and advertising purposes was wide and varied. A production of a page taken from a book of samples of work done on a Rotary Cyclostyle at the beginning of the century, is illustrated on page 109. It is a composite work involving two stencils, a Handwriting stencil for the wheel pen work and a typewriting stencil for the typing. The two stencils would be run off consecutively using different coloured inks, if desired.

In brief review

In those thirty years from 1875 to 1905 stencil duplicating was developed from a difficult, and more or less impracticable process, to the relatively sophisticated and highly practical procedure of rotary cyclostyling. It is interesting in review to consider again the main steps by which this came about.

The first big step away from the primitive and difficult towards the practicable and simple was the invention of the Cyclostyle pen in 1881. The second step was the introduction of a Japanese paper as a base for stencils in 1885. Step three was the invention of the improved Cyclostyle pen, the Neo, in 1888, which really made the reproduction of handwriting a practical proposition.

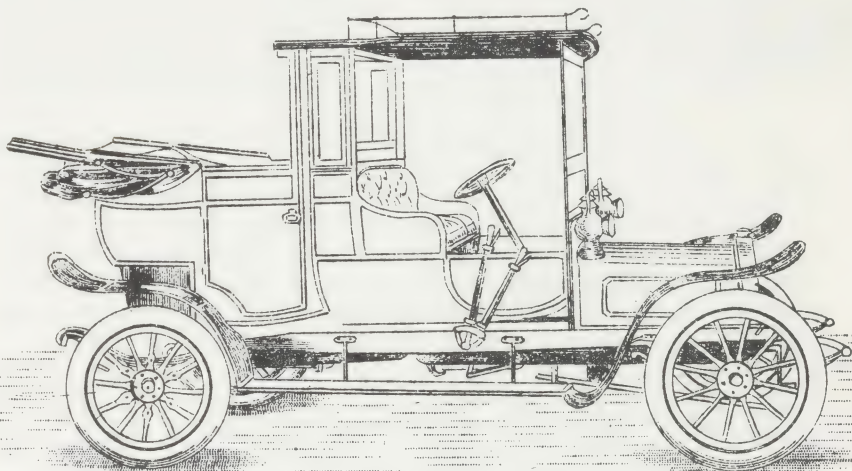


An early Rotary Cyclostyle.



The epitome of Edwardian elegance in office equipment and furniture.

*Specimen copy wholly reproduced on the
Rotary Cyclostyle.
(Gestetner's Patent.)*



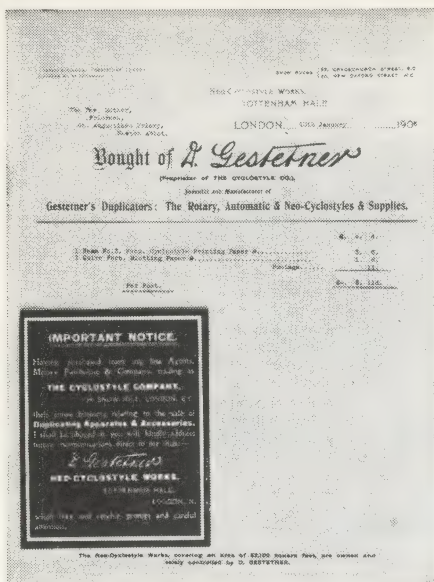
Gestetner's Rotary Cyclostyle is the most up-to-date and efficient Duplicator offering unsurpassed advantages in Cleanliness, Simplicity, Speed, Reliability and Economy.

It is equally well adapted for the reproduction of Handwriting - Typewriting - Designs - Tabulated Lists - Music.

Before buying any Duplicator see

The Rotary Cyclostyle

(Gestetner's Patent)



Left: An invoice stating: D. Gestetner, proprietor of the Cyclostyle Company'.

Right: A notice of removal.

Far Right: A contemporary drawing of the offices in Cross Street.

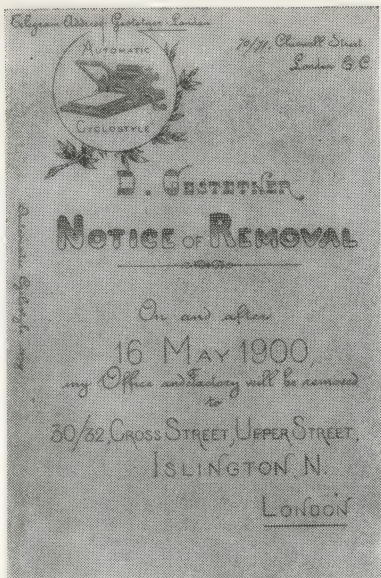
The extension of the idea of Japanese-base tissue to the making of a stencil which could be typed was the next big step. This brought about the important association of stencil duplicating with typewriting in the 1890's.

The duplicating machine at this stage, however, was still a flat-bed apparatus requiring hand operation. Gestetner's automatic machine in 1893 established the first successful breakaway from the hand-inked flat-bed with its drawbacks of limited speed and convenience. It pointed the way to rotary duplicating and represented the fourth big step in the march of progress.

This was followed by the Lowe and Ellam patents of 1896 for the single-drum rotary principle and, in 1900, by Gestetner's twin-cylinder system. In the early years of 1900 we find Dick, Klaber, and Gestetner more or less simultaneously filing patents in Great Britain and U.S.A. for their respective versions of a rotary machine and putting them on the market. What is important and interesting is that the two systems were patented independently, by several workers in the case of the two single-drum machine, with several manufacturers concerned; but by Gestetner alone for the twin-cylinder machine as patentee and manufacturer.

D. Gestetner, Manufacturer, Cross Street, London

Towards the end of the nineteenth century David Gestetner was still busy in his small factory in Chiswell Street, when the London civic authorities passed a bye-law requiring firms employing more than forty workers to have all staircases in use to be made of stone instead of wood. So he promptly expanded to new premises altogether—a three-story building in Cross Street, Islington, complete with stone staircase and room for a hundred people whom he was soon employing. The move was made on the 16th May 1900. The Notice of Removal is an interesting document in the Gestetner archives and, incidentally, an excellent example of the duplicating of handwriting made with a wheel pen on a handwritin



stencil. A reproduction of it is shown above, alongside an artist's impression of the premises.

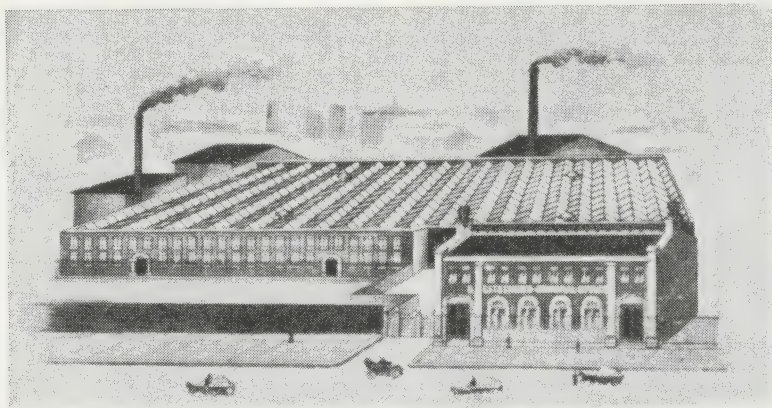
It was at Cross Street that Gestetner took out the patents for the twin-cylinder Rotary Cyclostyle machines, and it was there that the machines were manufactured. There Gestetner played his part in the beginning of the new era in the office—the second revolution in office history some twenty years after his little wheel had begun the first in 1881.

D. Gestetner and the Cyclostyle Company

In the early 1900's, as the Gestetner business began to grow and expand, particularly as Rotary Cyclostyles increasingly attracted the attention of the office world, the position of the Cyclostyle Company, with respect to Fairholme and Company on the one hand and D. Gestetner on the other, required some clarification. Fairholme and Company seemed to be selling Cyclostyle goods other than those manufactured by Gestetner, and David Gestetner was expanding his business by direct sales to the Continent. There was some litigation and preparation for litigation.

That the Cyclostyle Company was essentially David Gestetner's was eventually established in 1904 when he became the sole proprietor of the premises at New Oxford Street and Gracechurch Street. And it was in 1904 that David Gestetner's name appeared in the *Trade Marks Journal* as the sole proprietor of the Cyclostyle Trade Marks.

It is from this point that the D. Gestetner business, both manufacture and sales, emerges clear and independent, greatly consolidated by the building of a big new factory at Tottenham in North London with the new address: D. Gestetner, The Neo-Cyclostyle Works, London, N17. The factory was opened in 1904, covering an area of one acre, some 50,000 square feet. It is still there today expanded to an area of over a million square feet. *Viris aquirat eundo*: "he prospers that gets on with the job".



The David Gestetner business. *Top*: the factory at Tottenham. *Left*: 83 Gracechurch Street, London E.C.3. *Right*: 50 New Oxford Street, London, W.1.

Gestetner and the Neostyle Company

We have already mentioned pending litigation to resolve the situation arising out of Klaber's obtaining a Trade Mark registration of the word Neostyle (see page 103). Klaber, Gestetner's former American agent, was now managing director of the Neostyle Manufacturing Company which he had formed in London in 1900. It was this company that Gestetner now petitioned against for the removal of the word Neostyle from the register.

IN THE HIGH COURT OF JUSTICE.—COURT OF APPEAL.

Before LORDS JUSTICES VAUGHAN WILLIAMS, ROMER, and STIRLING,

October 27th 1903

IN RE NEOSTYLE MANUFACTURING COMPANY, LD.'S, TRADE MARK.

5 *Trade Mark.—Motion to rectify.—“Neostyle.”—First user as a Trade Mark.—Goods marked in this country for export only.—“Person aggrieved.”—Rectification.—Patents, Designs, and Trade Marks Acts, 1883–1888, sections 72, 73, 90.*

G. was the manufacturer of a patented “Cyclostyle” copying apparatus 10 from 1882 onwards, and in 1888 invented improvements for his apparatus, which he then called “Neo-Cyclostyle.” “Cyclostyle” was registered as a Trade Mark, but not “Neo-Cyclostyle.” In 1884 he employed K. as his sole sub-licensee and agent under an agreement for the sale of the goods in America. From January 1889 G. made in England and exported to K. in America as 15 his sole consignee similar goods marked “Neostyle.” The word “Neostyle” had been invented by K. in 1887, but was only used by him in America on the goods ordered from G., who never sold the goods so marked in England. In 1900 K., to the knowledge of G., formed the Neostyle Manufacturing Company, Ltd., in England for the sale of “Neostyle” goods, and in October 1901 registered 20 the word “Neostyle” as a Trade Mark. In August 1902 G. moved for the removal of the Trade Mark, and his motion was refused by Kekewich, J. G. appealed.

Held, on appeal (reversing the decision of Kekewich, J., but on different grounds), that G. was a “person aggrieved” within the meaning of section 90 of the Patents, 25 &c. Acts, 1883–1888; that as between G. and K. under the agreement of 1884 any names or designations in the nature of Trade Marks applied to goods manufactured by G. for sale in America would be acquired in the right of G. and not of K.; that K. had himself acquired no exclusive right such as would entitle him to register “Neostyle” as a Trade Mark; and that the sole right 30 of the English Company, the Respondents, was that derived from the user of the word since 1900, which had probably deprived G. of any right to bring an

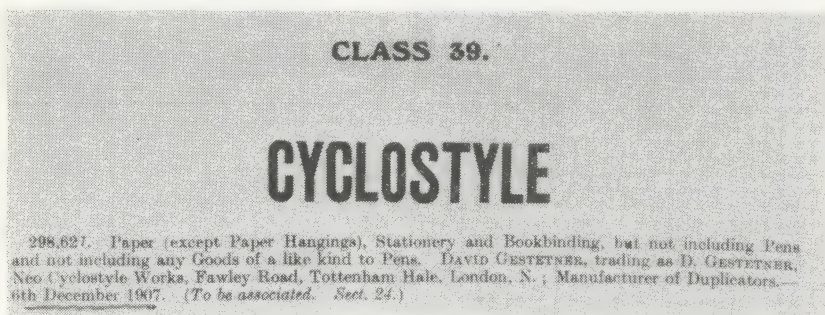
Gestetner wins his case at the Court of Appeal.

3rd March 1903 was the day of the hearing at the High Court of Justice. Incredibly, Gestetner lost the case. But in October of the same year in the Court of Appeal his case was argued to better effect and the learned judges were persuaded that “Gestetner was a seriously aggrieved person who should not suffer the injury to his great and growing business that the registration of the word Neostyle as a Trade Mark could cause”. The Appeal was allowed and Klaber was prevented from using the word Neostyle as a Trade Mark. This decision immediately affected the rotary

Neostyle which he was manufacturing and selling in London. So he renamed it Roneo, coining the word from the "Ro" of Rotary and the "Neo" of Neostyle. The word Roneo as a matter of fact had already been entered as a Trade Mark in 1901 jointly with the word Neostyle. And in 1907 Roneo Limited with Klaber as managing director was formed to take over the business of the Neostyle Manufacturing Company.

A famous Trade Mark lives on

The Trade Marks law was changed by Act of Parliament in 1905 so that a descriptive word could no longer be used as a Trade Mark. The word Cyclostyle was such a descriptive term. Indeed Cyclostyle and cyclostyling had become part of the language, although firmly associated with David Gestetner and the D. Gestetner business. Accordingly the Neostyle Manufacturing Company brought a case to High Court in 1907 and succeeded in getting the word Cyclostyle removed from the Trade Marks register.



But the old Trade Mark neither died nor faded away. It reappeared in the *Trade Marks Journal* of 1907 under D. Gestetner's name with the restriction that it could not apply to wheel pens and the like but could be used for all other Cyclostyle goods. Ironical that the famous Trade Mark now applied to all Gestetner products save the pen which he had invented and which gave birth and name to stencil duplicating.

APPENDIX I

A Select List of Patents

| Number | Date Applied for (where known) | Date Granted | Short Title | Inventor |
|-------------|--------------------------------------|---------------------------|--|-----------------------|
| 395 U.K. | | 7 Jan. 1714 | Impressing Letters on Parchment | Henry Mill |
| 1244 U.K. | | 14 Feb. 1780 | A New Method of Copying Letters | James Watt |
| 2305 U.K. | | 1799 | Multiple Writing Machine | M. I. Brunel |
| 2972 U.K. | | 7 Oct. 1806 | An Apparatus for Producing Duplicates of Writings | Ralph Wedgwood |
| 4524 U.K. | 6 Nov. 1879 | Provisional protection | Water Colour Printing Transfer Ink | David Gestetner |
| 4606 U.K. | | 1878 | A Gelatin Copying Block | Wilson |
| 2256 U.K. | | 1879 | A Gelatin Copying Block | Rosefeld |
| 7149 U.K. | | 1888 | A Clay Copying Block | Smith |
| 3150 U.K. | 15 Sep. 1874 | 19 Feb. 1875 | The Papyrographic Stencil Process | Eugenio de Zuccato |
| *3647 U.K. | 29 Sep. 1877 | 29 Mar. 1878 | The Trypographic Stencil Process and Duplicating Apparatus | Eugenio de Zuccato |
| 211877 U.S. | 18 May 1878 | | A Stencil Duplicating Apparatus | Eugenio de Zuccato |
| 5067 U.K. | 5 Apl. 1887 | 5 Jan. 1888 | Improvement of Duplicating Apparatus of U.K. 3647 | Eugenio de Zuccato |
| 133841 U.S. | 13 Nov. 1871 | 10 Dec. 1872 | A Typewriter | Thomas A. Edison |
| 132456 U.S. | 15 Mar. 1872 | 22 Oct. 1872 | Needle-perforated Paper Tape | Thomas A. Edison |
| 3762 U.K. | 26 Oct. 1875 | 26 Apl. 1876 | Electric Pen for Stencil Cutting and a Duplicating Apparatus | Thomas A. Edison |
| 180857 U.S. | 13 Mar. 1876 | 8 Aug. 1876 | see U.K. 3762 | Thomas A. Edison |
| 196747 U.S. | 23 Apl. 1877 | 6 Nov. 1877 | Improvements in Electric Pens | Thomas A. Edison |
| 224665 U.S. | 17 Mar. 1879 | 17 Feb. 1880 | Method of making Stencil by Means of File Plate or Bank of Needles | Thomas A. Edison |
| 295990 U.S. | 9 Dec. 1878 | 1 Apr. 1884 | Typewriter with Type Faces Composed of Needle Points | Thomas A. Edison |
| 2725 U.K. | 3 July 1880 | 3 Jan. 1881 | Wire Surface for Cutting Wax Stencils | David Gestetner |
| 1656 U.K. | 14 Apl. 1881 | Provisional only | Preparing and Printing Wax Stencils | David Gestetner |
| 2450 U.K. | 3 June 1881 | 2 Dec. 1881 | Toothed Wheel for Cutting Wax Stencils | David Gestetner |
| 242919 U.S. | 31 Jan. 1881 | 14 June 1881 | see U.K. 2725 | David Gestetner |
| 268009 U.S. | 21 Nov. 1881 | 28 Nov. 1882 | see U.K. 2450 | D. Gestetner |
| 7536 U.K. | 20 June 1885 | 18 Mar. 1886 | Toothed Wheel Pen for Cutting Music on Stencils | David Gestetner |

* 29/3/78 is date of amended specification: final acceptance was not until 23 March 1886.

| Number | Date Applied for | Date Granted | Short Title | Inventor |
|-------------|------------------|--------------|---|--------------------------------|
| 332890 U.S. | 18 Apl. 1885 | 22 Dec. 1885 | Base Paper for Wax Stencils | D. Gestetner |
| 1594 U.K. | 2 Feb. 1888 | 2 Nov. 1888 | Silk Sheet for Use with Typewriting Stencils | David Gestetner |
| 11832 U.K. | 16 Aug. 1888 | 28 Sep. 1888 | Modified Cyclostyle Pen | D. Gestetner |
| 434331 U.S. | 19 Sep. 1888 | 12 Aug. 1890 | see U.K. 11832 | D. Gestetner |
| 19438 U.K. | 10 Nov. 1891 | 1 Oct. 1892 | An Automatic Stencil Printing Apparatus called the Automatic Cyclostyle | David Gestetner |
| 536720 U.S. | | 2 Apr. 1895 | see U.K. 19438 | D. Gestetner |
| 10296 U.K. | 30 May 1892 | 23 July 1892 | Method of Cutting a File Plate | David Gestetner |
| 333864 U.S. | 19 June 1885 | 5 Jan. 1886 | Flatbed Duplicating Apparatus | Augustus D. Klaber |
| 404778 U.S. | 18 Apl. 1888 | 4 June 1889 | Flatbed Duplicating Apparatus | Assigned to Augustus D. Klaber |
| 17140 U.K. | 20 Nov. 1888 | | see 404778 U.S. | Assigned to Augustus D. Klaber |
| 405198 U.S. | 6 Jan. 1888 | 11 June 1889 | Porous Paper Diaphragm Wax Margined | Assigned to Augustus D. Klaber |
| 1246 U.K. | 23 Jan. 1889 | 2 Mar. 1889 | Silk Sheet Writing Plate | Assigned to Augustus D. Klaber |
| 414378 U.S. | 7 Mar. 1889 | 5 Nov. 1889 | Flatbed | Assigned to Augustus D. Klaber |
| 404034 U.S. | 11 Oct. 1887 | 28 May 1889 | Flatbed Duplicating Apparatus | A. B. Dick |
| 559687 U.S. | 11 Oct. 1887 | 5 May 1896 | Stencil Typing Accessory | A. B. Dick |
| 562590 U.S. | 27 Dec. 1887 | 23 June 1896 | Modification of Wax for Typewriting Stencils | A. B. Dick |
| 466557 U.S. | 20 Oct. 1890 | 5 Jan. 1892 | Stencil Typing Accessory | A. B. Dick |
| 538663 U.S. | 5 Sep. 1894 | 7 May 1895 | Automatic Flatbed | A. B. Dick |
| 516477 U.S. | 22 Mar. 1892 | 13 Mar. 1894 | Ruling Plate and Pen for Writing Music on Stencils | A. B. Dick |
| 578726 U.S. | 10 Sep. 1895 | 16 Mar. 1897 | An Automatic Flatbed | A. B. Dick |
| 66410 U.S. | 5 Aug. 1899 | 22 Jan. 1901 | Silk Diaphragmed Frame | A. B. Dick |
| 345109 U.S. | 28 Sept. 1885 | 6 July 1886 | Method of Producing a Stencil by Abrasion | John Brodrick |
| 424090 U.S. | 8 Dec. 1885 | 25 Mar. 1890 | Method of Producing a Stencil by a Kind of File Plate | John Brodrick |
| 377706 U.S. | 20 May 1886 | 7 Feb. 1888 | Waxed Yoshino Stencil | John Brodrick |
| 12013 U.K. | 5 Sep. 1887 | 6 Apl. 1888 | see U.S. 377706 | Alison (for Brodrick) |
| 390430 U.S. | 2 May 1887 | 2 Oct. 1888 | Flatbed Stencil Duplicating Apparatus | Zimmer |
| 9867 U.K. | 20 Aug. 1886 | 30 Jan. 1886 | Flatbed Duplicating Apparatus | A. Paget |
| 9415 U.K. | 13 Apl. 1897 | 26 Feb. 1898 | Flatbed Duplicating Apparatus | Walter Binns |

| Number | Date Applied for | Date Granted | Short Title | Inventor |
|-------------|------------------|--------------|--|-------------------------------|
| 545093 U.S. | 17 June 1895 | 27 Aug. 1895 | For a Stencil Base Tissue of Mixed Fibre Short and Long but Interesting Chiefly for Summary of Stencil Making Principles | Pomeroy |
| 24409 U.K. | Oct. 1897 | | Flatbed Duplicator with Frame Raised by Spring | J. & F. Ellam |
| 12011 U.K. | 20 Aug. 1888 | 27 July 1889 | Web fed rotary for Stencil or gelatin | H. B. Thompson U.S.A. |
| 23277 | 18 Oct. 1896 | | Rotary Single-Drum Duplicator | F. & J. Ellam |
| 584787 U.S. | 27 Aug. 1896 | 22 June 1897 | Completely Rotating Single Drum Stencil Duplicating Machine | Harry H. Lowe |
| 658037 U.S. | 15 Feb. 1900 | 18 Sep. 1900 | Improvements to Rotary Neostyle Stencil Duplicating Machine described in 584787 U.S. | A. B. Dick |
| 679140 U.S. | 10 June 1899 | 23 July 1901 | A Half-Drum Rotary Duplicating Stencil Machine | A. B. Dick |
| 729045 U.S. | 6 Jan. 1903 | 20 May 1903 | Modification of Single-Drum Rotary Stencil Duplicating Machine | A. B. Dick |
| 746930 U.S. | 24 Aug. 1903 | 15 Dec. 1903 | Improvement in Single-Drum Stencil Duplicating Machines | A. B. Dick |
| 14954 U.K. | 20 July 1899 | 7 Oct. 1899 | Semi-Rotary Single Drum Stencil Duplicating Machine | A. B. Dick |
| 3738 U.K. | 26 Feb. 1900 | 21 Apl. 1900 | see 658037 U.S. | A. B. Dick |
| 24745 U.K. | 18 Nov. 1904 | 15 Dec. 1904 | Stencil Fixing Bar | A. B. Dick |
| 8544 U.K. | 25 Apl. 1901 | 24 Apl. 1902 | Half-Segment Rotary Stencil Duplicating Machine | A. D. Klaber London |
| 19444 U.K. | 4 Sep. 1902 | 4 Sep. 1903 | Improvements in Inking Arrangements of Rotary Neostyle Stencil Duplicating Machines | A. D. Klaber London |
| 628651 U.S. | 18 Nov. 1898 | 11 July 1899 | Improvements to Rotary Stencil Duplicating Machine | George W. Cummings |
| 394690 U.S. | 3 Feb. 1888 | 18 Dec. 1888 | Web-Fed Single-Drum Rotary Duplicating Machine | John H. C. Hamill |
| 23406 U.K. | 21 Dec. 1900 | 21 Dec. 1901 | Twin-Cylinder Rotary Stencil Duplicating Machine | D. Gestetner Cross St. London |
| 25373 U.K. | 12 Dec. 1901 | 30 Jan. 1902 | Improvements on Twin-Cylinder Rotary Stencil Duplicating Machine | D. Gestetner Cross St. London |
| 14303 U.K. | 24 Jan. 1902 | 7 May 1903 | Stencil Fixing Arrangements | D. Gestetner Cross St. London |
| 18257 U.K. | 9 Sep. 1905 | 5 July 1906 | Self-Feed Mechanism for Twin-Cylinder Stencil Duplicating Machine | D. Gestetner |
| 707579 U.S. | 16 July 1901 | 26 Aug. 1902 | as U.K. 23406 | D. Gestetner |
| 700031 U.S. | 1 Feb. 1902 | 13 May 1902 | as U.K. 25373 | D. Gestetner |
| 746950 U.S. | 2 Sep. 1903 | 15 Dec. 1903 | Porous Ink Screen | D. Gestetner |
| 732542 U.S. | 14 Oct. 1902 | 30 June 1903 | as U.K. 14303 | D. Gestetner |
| 8068 U.K. | 3 Apl. 1906 | 17 Jan. 1907 | Stencil Fixing Arrangement | Jacob Gestetner |
| 835303 U.S. | 6 Mar. 1906 | 6 Nov. 1906 | as U.K. 18257 | D. Gestetner |
| 833713 U.S. | 7 May 1906 | 16 Oct. 1906 | as U.K. 8068 | D. Gestetner |

APPENDIX II

Reports of Patent Cases and Other Lawsuit Reports

U.S. Court Circuit Report of Dick v. William G. Freuth

Re: Patent infringement 1889.

Dick v. Ellam's Duplicator Company

Re: Action for infringement. High Court of Justice June 1899.

Neostyle Manufacturing Company v. Ellam's Duplicator Company

Re: Trade Name of Goods December 1903. High Court of Justice.

Times Report of Gestetner v. Neostyle Manufacturing Company Ltd,
Chancery Division, High Court of Justice, 4th. 10th March 1903.

Re: removal of word Neostyle from Trade Marks Register.

Times Report of Gestetner v. Neostyle Manufacturing Company Ltd,
Court of Appeal, High Court of Justice, 27th October 1903.

Re: Removal of word Neostyle from Trade Marks Register.

Documents prepared in connection with various actions concerning D.
Gestetner and F. W. Barton Massey-Mainwaring and the Cyclostyle
Company, King's Bench Division 1904.

Neostyle Manufacturing Company Ltd, v. David Gestetner petitioning for
removal of the word Cyclostyle from the Trade Marks Register. Chancery
Division, High Court of Justice, 10th-11th July 1907.

Neostyle Manufacturing Company Ltd, v. David Gestetner, Court of
Appeal, High Court of Justice, 27th-28th November 1907.

Re: Removal of word Cyclostyle from the register.

APPENDIX III

Book Sources

- Inks: C. Ainsworth Mitchell: Griffin & Company 1937.
James Watt: Andrew Carnegie (Doubleday & Page), 1905.
The Solicitor's Law Stationery Society Ltd, Catalogue 1900.
Edison His Life and Inventions: Martin & Dyer (Harper), 1910: revised by Meadowcroft, 1929.
Edison's Open Door: Alfred O. Tate (E. P. Dutton & Co), 1938.
Edison. Matthew Joseph's Biography: (McGraw-Hill).
Thomas Alva Edison: The Edison Foundation, N.Y.
Menlo Park Reminiscences: Francis Jehl.
Edison and the Menlow Park Buildings: Francis Jehl (Edison Institute), 1932.
Manual of Duplicating Processes: W. Desborough (Pitman), 1917.
Copying and Duplicating Processes: W. Desborough (Pitman), 1930.
Perennite: (Gestetner, France), 1951.
The Cyclostyle: (Gestetner, London, N.17), 1959.
Office History Series: W. Hollis: Imperial News 1950's.
Kee Lox Carbon Paper, Rochester, U.S.A.
Popular Scientific Recreations, 1890 (?)
Office History Series: W. B. Proudfoot: Gestetner News 1960's.
Life of Sir Isaac Pitman: Alfred Baker: 1908.
Pitman's Manual of Business Training: 1897.
Office Machines, Appliances and Methods: W. Desborough (Pitman) 1921.
History of Typewriters: (Science Museum publication) 1964.

APPENDIX IV

List of Other Documents

-
- Science Museum Catalogue (annotated) of exhibits and items in store concerning Writing and Copying and Duplicating.
- Directions for using James Watt's Copying Machines, 1819.
- Forerunner of Carbon Papers: Geoffrey Wills—an article *Country Life*, 18th December 1958.
- James Watt—Instrument Maker: Chartered Mechanical Engineer. March 1962. An article.
- History of Typewriters: Science Museum Monographs.
- Letters from Ralph Wedgwood to his daughter 1805: a copy from archives of Josiah Wedgwood and Sons Ltd.
- Directions for using R. Wedgwood's Patent Manifold Writer, 1818.
- Certificate of Merit issued to Ralph Wedgwood for his Stylographic Writer by Royal Institution, 1829.
- Carbon Paper. H. Hollis, *Imperial News*, 1951. An article.
- Carbon Paper. Kee Lox Manufacturing Co. An article.
- Memo of conversation with Mr Fred Ellam at Royal Air Force Club, Piccadilly, April, 1967.
- Correspondence with Town Clerks and Libraries re: early Gestetner addresses, private and business.
- Letter of historical recollections from Jacob Gestetner to Sigmund Gestetner, 21st November 1950.
- Early Sales and Production Ledgers in Gestetner archives.
- Gestetner Family Geneology Tables.
- Personal Letter Copying Book (870621) of T. A. Edison, Edison Historic Site, West Orange, N.J.
- Cardex and Files on Edison Electric Pen at Edison Historic Site, West Orange, N.J.
- Cardex and Files on Mimeograph at Edison Historic Site, West Orange, N.J., containing copies and originals of correspondence between Edison and his staff with A. B. Dick.
- "Fifty Years" by A. B. Dick: and pamphlet on A. B. Dick history by A. B. Dick.
- Letter from A. B. Dick to Wm. H. Meadowcroft on mention of Mimeograph in Meadowcroft's revision of Martin & Dyer's biography of Edison.
- The Scandalous History of Carbons in possession of the Kee-Lox Carbon Company of America.
- Letter from Caribonum Limited on the History of Carbons.

Letter from Kores Manufacturing Company Limited on enquiry into the origin of Carbons.

Notes and facsimile copies of literature on Mimeographs (flat-bed) at Edison Historic Site, West Orange, N.J.

Memo of H. J. Picking's visit to Menlo Park Buildings, Michigan.

An instrument of assignment between David Gestetner and Fairholme and Company—in Gestetner archives.

Various agreements between David Gestetner and A. B. Dick—in Gestetner archives.

Various instruments of assignment between Brodrick and A. B. Dick—copies from United States Patent Office, Washington.

Various instruments of assignment between Lowe and the Neostyle Company and A. B. Dick—copies from United States Patent Office, Washington.

Trade Marks Journal, 1882 to 1909.

INDEX

References shown in italics indicate an illustration

- Advertising, 99
(*and see* particular apparatus)
Albert, Prince Consort, 26
American Institute of Engineers, 46
aniline dyes, 28, 29, 80fn
 hectograph and, 34
autographic printing, 40, 44
automatic duplicating, 92-4
- Bamboo fibre, 57
Berrick and Company, 57
Berrick Brothers, 57, 82, 83
Bingham, Mr., 76
Binns, Walter, 71
book sources, 119
Boulton, Matthew, 21
Boyle, Robert, 19
brief review of duplicating, 107-10
British Museum, 26
Brodrick, John, 82
Brunel, Isambard Kingdom, 20
Brunel, Sir Marc Isambard, 20
business, development in, 37
- Carbon black, 34
carbon-coating machine, first, 34
carbon copies, 32, 32-4
carbon copying, 34
carbon paper, 33
 composition of, 32, 34
 first, 25
 general office use, 28
 manufacture of, 32
 modern one-sided, 34
 more important role of, 33
 standard practice with typewriter, 34
 stencils, and, 87
 typewriter, and, 32, 33
 use of, 81, 87
carbonic copies, 27
- carbons:
 France, originating in, 32
 Wedgwood, 32
change of tempo, 26-8
circular letter, the, 99
clay tablets, Babylonian, 15, 17
 duplication of, 17
 in envelope, 17
 modern imitation, 16
Combined Typo Stencil, 87
copy clerks:
 female typists, and, 57
 Victorian, 17, 18
copiers, limited application of, 26
copying and duplicating, history of, 40
copying, before stencils, 15-17
copying book process, 31
copying inks and pencils, 29
copying machines:
 invention of, 18
 portable, 21-3
 private use of, 18, 21
copying methods, 18th and 19th centuries, 17-18
copying to duplicating, transition, 37-40
Crystal Palace, The, 27
Cyclostyle, The, 52
 advertisements, 71-2, 71
 agreements and indentures, 73-4
 artistic effects with, 69, 70
 automatic, 94, 96, 98, 101
 advertisements for, 96, 97, 98
 rotary adaptation of, 101
 duplicating apparatus, 74
 exclusive licence for, 74
 life of stencil, 67
 music and, 54
 origin of word, 67
 process, 76

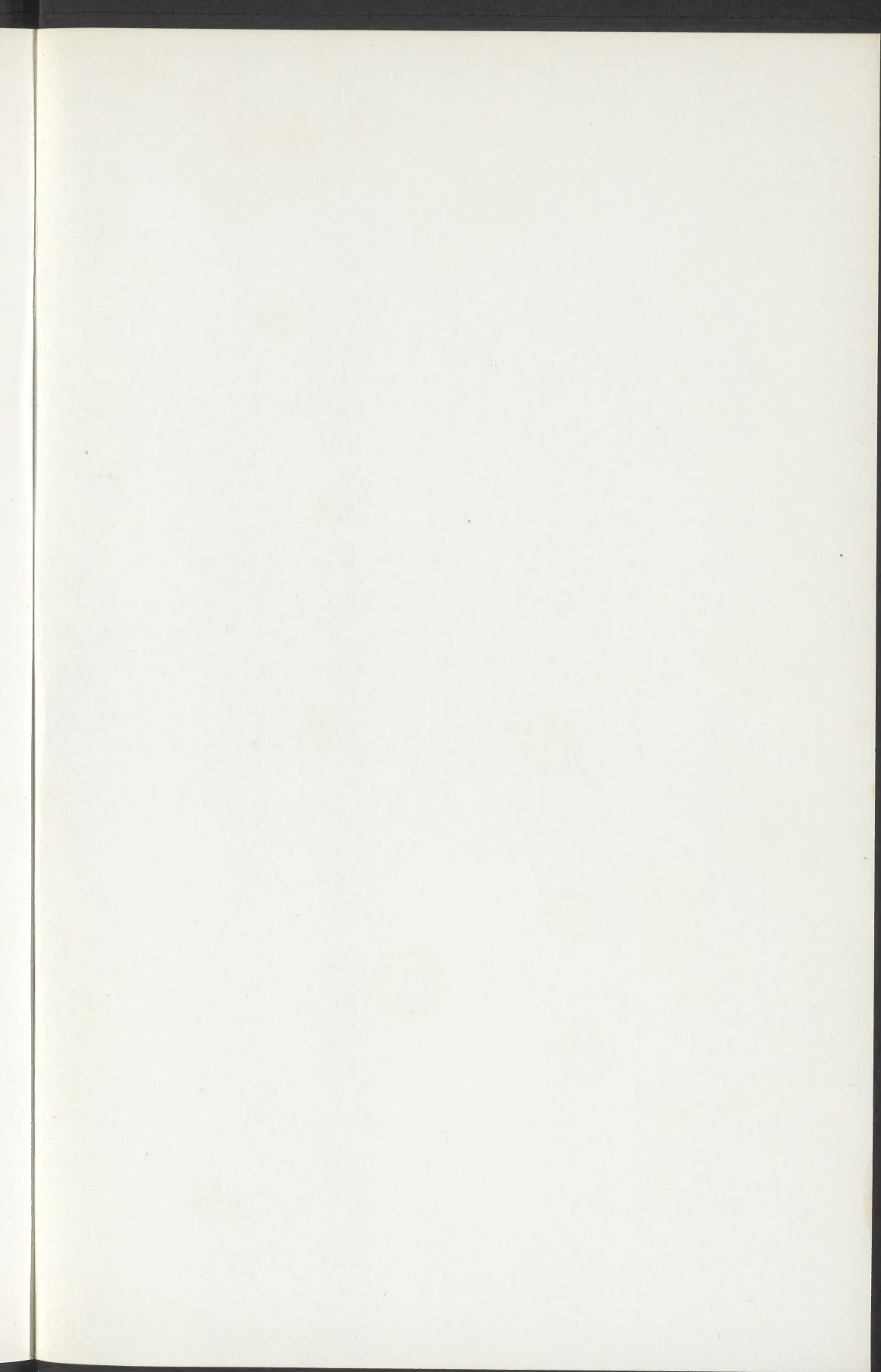
- Cyclostyle—cont.
 rotary, 102, 107, 108
 specimen of work, 109
 silk plate, 92
 spread of, 67
 stencil paper, 59
 trade marks, 71–2, 73
 wheel pen, *q.v.*
 (*see also* Neo-cyclostyle and Neo-style)
 Cyclostyle Company, 96, 101
 early days of, 71
 Cyclostyle Duplicating Apparatus, 54–56, 56
 description of, 54
 Cyclostyling, 64–8
 becoming established, 81
 cylinder seals, Babylonian, 15, 16, 16
 as amulet or necklace, 17
 impression from, 16
- Dakin, Cyrus P., 32
 Davy, Sir Humphrey, 26
 Desborough, W., 67
 diaphragm(s), 85–7, 93
 Dick, A. B., Company, 75, 78
 Dick, Albert Blake, 75, 76, 92, 96, 98, 102, 104, 110
 documents, 120
 duplicating:
 apparatus, 44
 definition of, 11
 from copying to, 37–40
 need for, 99
 dye industry, 29
- Edison-Dick association, 76
 Edison Electric Pen and Duplicating Press Company, 46
 Edison, file plate process, and, 50
 Edison Mimeograph (*see* Mimeograph)
 Edison—*The Open Door*, 76
 Edison, Thomas Alva, 12, 42, 44, 45, 75, 76, 82
 Electric Pen Company, The, 50
 electric pen process, 46, 76 (*see also* pen, electric)
 Ellam brothers, 98, 104
 Ellam patents, 110
 Ellam's Duplicating Company, 98
 Ellam's rotaries, 104, 105
 Esdaile, Arundel, 26
 Evelyn, John, 18, 19, 22
- Fairholme and Company, 71, 72, 74, 80, 96, 111
 agreement with Gestetner, 71
 wheel pen patent, and, 73
 file plate process, 75
 alternative surface, 50
 currently used, 51
 Edison, and, 50
 Far East, and, 51–2
 Gestetner, David, and, 50
 magazine produced by, 48, 49, 49
 (*see also* Trypograph)
 flat-bed stencil duplicator, 98
 modifying, 99
 Ford, Henry, 44, 45
 forgery, fear of, 21
 Franklin Institute, 78
- Gampi, 57
 gelatine process (*see* hectograph)
 gelatine, use of, 34, 36
 Gestetner Company:
 beginning of, 71
 business development, 110–4
 factory and shops, 112
 signature trade mark, 76
 Gestetner, David, 11, 12, 39, 55, 74, 76, 78, 92, 95, 96, 98, 101, 102, 104, 110
 agreements and indentures, 73–4
 agreement with Fairholme Company, 71
 automatic Cyclostyle, 94
 birth of, 80
 birthplace of, 79
 Cyclostyle, and, 52
 en route for USA, 79
 file plate process, and, 50
 Japanese paper imports, 83
 Japanese paper patent, 57
 life of, 80
 wheel pen, and, 39, 62
 wheel pen patent, 71, 72, 73
 Gestetner Diaphragm Duplicator, 93
 Gestetner/Dick reciprocal agreement, 98
 Gestetner factory, 71, 94, 112

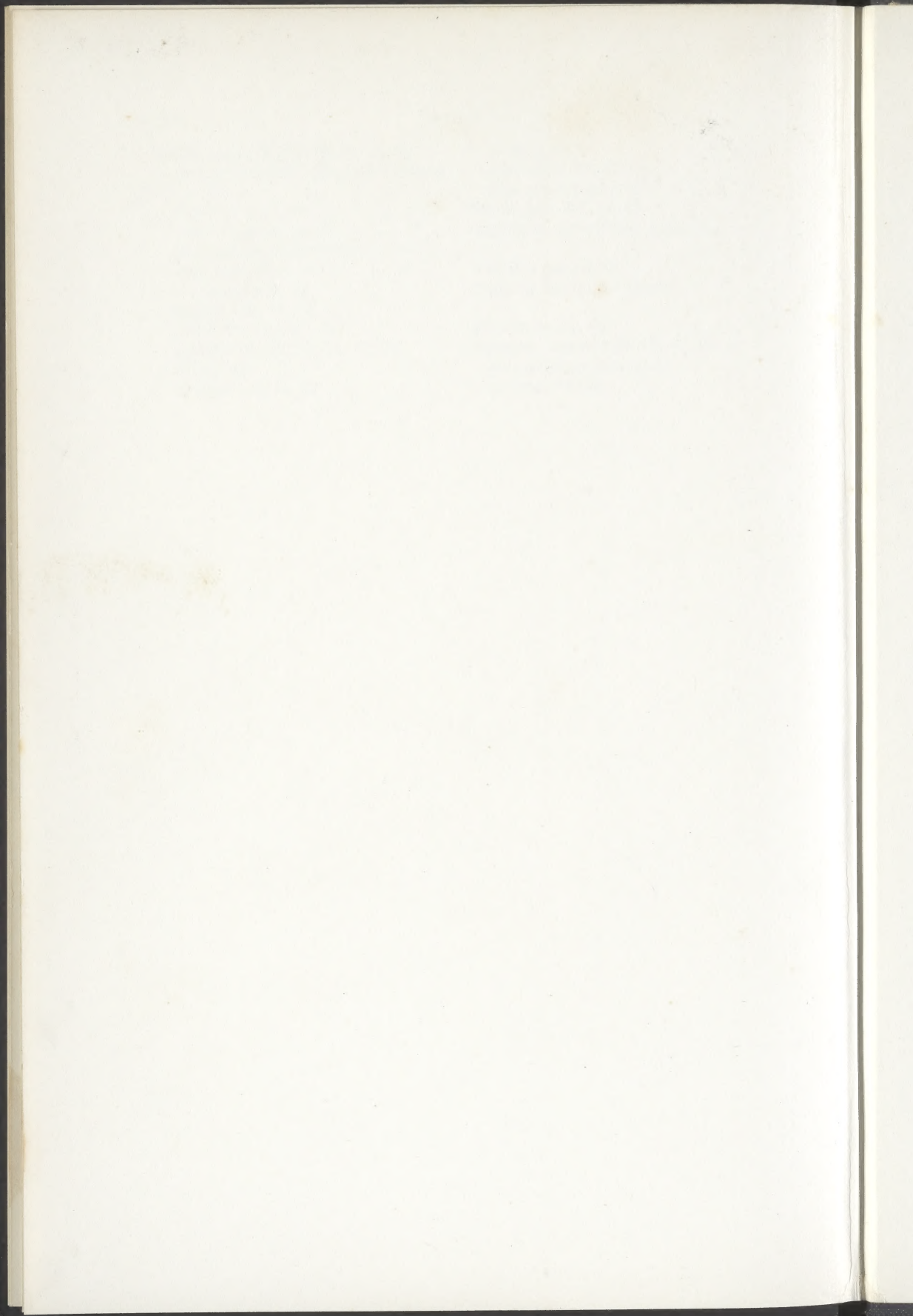
- Gestetner, House of, 71
 Gestetner, Jacob, 74, 104
 Gestetner Museum, 107
 Gestetner v. Klaber, court action, 112–114
 Gestetner's kite picture, 59
 Gillott, Joseph, 34fn, 62fn
 Great Exhibition of 1851, 26, 27
 Greenwich Observatory, 26
- Hartlib, Samuel, 18–19
 Hawkins, Mr., 20
 Hectograph, 28, 34–6, 35, 39
 inks, 68
 method of operation, 34
 process, the, 80
History of the British Museum, 26
 Holbein cartoon, 46
 holograph, 32
 Horii Company, The, 51
 Horii, Mr., 51
 Hunter, Dard, 62
- Ink(s):
 aniline dyes, and, 28, 29, 36, 80fn
 copying, 28, 29, 80fn
 Cyclostyle, 66
 fluid, 68
 Hectograph, 68
 Mr. Hartlib's, 18–19
 recipe for Watt's, 21
 violet, Hectograph, 68
 Watt's special copying, 36
 International Shorthand Congress, 81fn
- Jefferson, Thomas, 20, 36fn
 John Scott Legacy Medal, 78
- Kee Lox Carbon Paper Company, 32fn
 Keir, James, 21
 Klaber, Augustus David, 73, 76, 92, 96, 102, 103, 110, 112
 Cyclostyle, and, 74
Knowledge, 72, 96, 98
- Lawsuit reports, 118
 letter copying book, 29, 30, 32
 adoption in offices, 29
 in the home, 32
 letter copying book process, 28–32
 method, 28
 letter copying press, 30
 (see also screw press)
 Lowe, Henry W., 102, 103
 patents, 110
 Lowe's single drum machine, 102, 103
- Magazines, 100
 mail order business, 99
 manifold stylographic writer, 24–6, 26, 28
 certificate of merit, 25, 26
 company formed, 26
 description of, 24–5, 24
 increased use of, 28
 offices and, 26
 users of, 26
 method, 25
Manual of Duplicating Methods, A, 67
 Marks and Spencer, 99
 Massey-Mainwaring, Hon. William Frederick Barton, 71, 74, 80
- mauvine, 29
 mechanical aids, introduction of, 18
 Mill, Henry, 19
 patent of 1714, 19
 Milton, John, 19
 Mimeograph, the, 75–6, 75, 85, 96
 origin of word, 76
 patent, 75
 rotary, 102, 104, 105
 'modern' copying process, first, 19
 'modern' office, the, 99–101
 monks, 17
 Moore, Frederick, 71
Morus papyrifera sativa, 82
 multiple copying, 31
- Naphtha, oil and carbon in, 34
 needle-point copy, 45
 Neo-cyclostyle, 62–4, 86
 at work, 66
 duplicating apparatus, 63, 64, 93
 improving duplicating apparatus, 93
 patent, 63
 under the microscope, 64
 Neostyle, 62, 76–8, 96
 advertisement, 77
 court case with A. B. Dick, 78
 duplicating apparatus, 78

- Neostyle—cont.
 registration of name, 112
 rotary, 102, 103, 105, 111
 compared with Mimeograph, 104
 Neostyle Manufacturing Company,
 96, 112
 nitrocellulose, 87
- Office, new era in, 100
 office scribblers, Georgian, 17
- Paper,
 comparison of Japanese, 84
 copying, 31
 Cyclostyle stencil, 59
 Imperial Gift, 82
 Japanese, 31, 39, 65, 78, 82, 108
 American patent, 74
 drying in the sun, 61
 enlargement of, 64
 Gestetner's patent, 57, 58, 74
 hand-made, 61
 material for, 62
 Takamatsu tissue, 82, 91
 first imported, 83
 Tengujo tissue, 82
 Yoshino tissue, 82, 82-4, 93
 first imported, 83
 selecting, 83
 under the microscope, 83
Papermaking Pilgrimage to Japan, 62
 Papyrograph, The, 40-2, 49
 description of, 40
 Trade Marks Journal on, 41
 Partridge and Cooper, 74
 patent(s):
 cases, 118
 select list of, 115-17
 pen(s):
 Brunel's, 26
 Cyclostyle, 108
 electric, the, 42-6, 49
 copy from, 45
 description of, 42
 handling difficulty, 46
 pamphlet, 43
 for all purposes, 68-9, 68
 multiple, 19-20, 20
 main use of, 20
 Neo-Cyclostyle, 76
 quill, the, 34fn, 62fn
 steel nib, 34fn, 62fn
 stencil puncturing, 50
 through the ages, 60
 vibrating, 44
 (see also wheel pen)
 pen and pencil, inadequacy of, in copy-
 ing, 33
 Pennsylvania Cyclostyle Company
 The, 76
 perforating silk, 85, 92-3
 Perkin, William, 29
 Pepys, Samuel, 19
 Polygraph, 36
 printing:
 invention of, 12
 office literature, and, 13
 publicity departments, 99
- Reciprocating needle, the, 50
 Remington and Sons, E., 33
 Remington Sewing Machine Com-
 pany:
 early typewriter advertisements, 33
 Ritzerfeld, Wilhelm, 36
 Rogers, Lebbeus H., 32, 33, 34
 death of, 34
 Roneo, 114
 rotary duplicator, 99, 100-1
 introduction of, 99
 kinds of, 101-3, 101
 rotary principle, the, 102fn
 Royal Institution, The, 25, 26
 Royal Society, The, 19
- St. Audrey's Fair, 40
 'Scandalous History of Carbons, The',
 32fn
 Schapiro, Alexander, 36
 Schapirograph, 36
 screw press, the, 28
 (see also letter copying press)
 scribes, 17
 Selfridge, Gordon, 99
 shorthand dictation, 81
 single-drum machines, 101, 103
 spirit duplicating, 36
 stencils:
 art of typing, 88, 89
 backing sheet, 87
 business late 19th century, 94-8
 Combined Typo No. 15 ... 86, 87

- stencils—cont.
 climate, effect of, 87
 Cyclostyle, 82
 development of typewriting on, 82
 different kinds of, 39, 40
 distortion of, 85
 enlargement of wheel pen cut on, 64
 file plate method of cutting, 75
 first aid for early, 90
 first typewriting, 84–5, 84
 cutting problems, 85
 handwriting, 81
 in retrospect, 78–80
 on typewriting, 91–2
 holding on rotating surfaces, 102
 how paper tissue holds character, 38
 letter cut, 83
 lettering guide, 39
 life of Cyclostyle, 67
 origin of the word, 40
 plasticised, 87
 portion of Neo-Cyclostyle, 67
 pressure sensitive, 88
 process, potential for, 100
 special typewriter for, 76
 typewriter, and, 81
 special porous tissue, 82
 typewriting, 98
 duplicating problems, 85
 early form, 86
 fixing, 87
 improvements to, 85–8
 problems, 86
 wax, 87
 waxed, 39
 writing on, 39
 Yoshino, 84, 98
 stencil-holding frame, 44
 stenographers:
 Greek and Roman, 17
 stylus, 49
 metal, 25
- Takamatsu, 57
 prototype of modern stencil, 57
 Takamatsu tissue (*see* paper)
 tally clerks, Renaissance, 17
 Tate, A. C., 76
 tempo of commerce, 26
 Tengujo tissue (*see* paper)
- Thompson, H. B., 102fn
Trade Marks Journal, 41, 42, 71
 Trypograph, The, 46–9, 47
 advertisement for, 47
 description, 48
 duplicating apparatus, 50
 method of operation, 46
 origin of word, 48
 Trade Mark, 48
 twin-cylinder machine, 101, 104, 106
 Gestetner system, the, 110
 typewriter, 34
 character under the microscope, 83
 development of, 28
 early advertisements, 33
 impression on Yoshino paper under
 microscope, 83
 platens modified for stencil cutting,
 82
 Sholes and Glidden, 53
 shorthand and, 81
 with needle-point face, 76
 typist, the, 57, 81
- Unz, Mr., 50, 76
- Victorian office, symbols of the early,
 31
- Watt, James, 19
 portable copying machine, 21–3, 22,
 26
 cost of, 21
 process, 22
 patent, 23
 special copying ink, 36
 Watt's copying method, 28
 wax:
 modification of, 85
 use of hot, 34
 'waxes', 87
 wax stencils, 12
 wedge-stylus, 17
 Wedgwood, Josiah, 21
 Wedgwood, Ralph, 24, 25, 26
 Wedgwood, Thomas, 24
 Wedgwood's writer (*see* manifold
 stylographic writer)
 Western Electric Company, 46

- wheel pen(s), 12, 64, 78, 85, 91, 92
 - comparison with file plate process, 52
 - detail of 'nib', 64
 - different styles of, 68
 - drawing and illustrating, 69
 - improved, 62-4, 62
 - patents and, 62
 - music, and, 54, 54
 - original idea, 50
 - patents for, 52, 53, 71, 72, 73
 - ruling, 69
 - toothed, 39, 52, 52
- writing, 68
- zinc-plate, 91, 92
 - (*see also* Cyclostyle)
- Wolff, Mr., 40, 42, 49
- writing to typewriting, from, 81-2
- Yoshino stencil, 84
- Yoshino tissue (*see* paper)
- Zinc sheet, 52, 92
- Zuccato, Eugenio de, 12, 40, 48, 49
 - extract from patent, 41
 - patents, 42, 48





MC390/ICA

W. B. Proudfoot was born and educated in Dundee. After extensive studies in pharmacy and chemistry he became a lecturer at Dundee Technical College, but moved to London in 1944 to join a research team doing war work on reclaiming rubber at Gestetner Limited, Tottenham. After the war he remained with the firm and was subsequently involved in Gestetner's industrial research and development on stencil duplicating and related products. He was later appointed Head of Research, an appointment he retained up to his retirement in 1970.

With some past experience as a freelance writer, Mr. Proudfoot became a regular contributor to Gestetner's house journals, writing on the stencil duplicating arts and the history of the process. These initial articles fostered a further interest in the historical background to methods of copying and duplicating and in the late 1960's Mr. Proudfoot instigated a fuller research study with the encouragement and support of the Gestetner company. This book is the important result of that study.

